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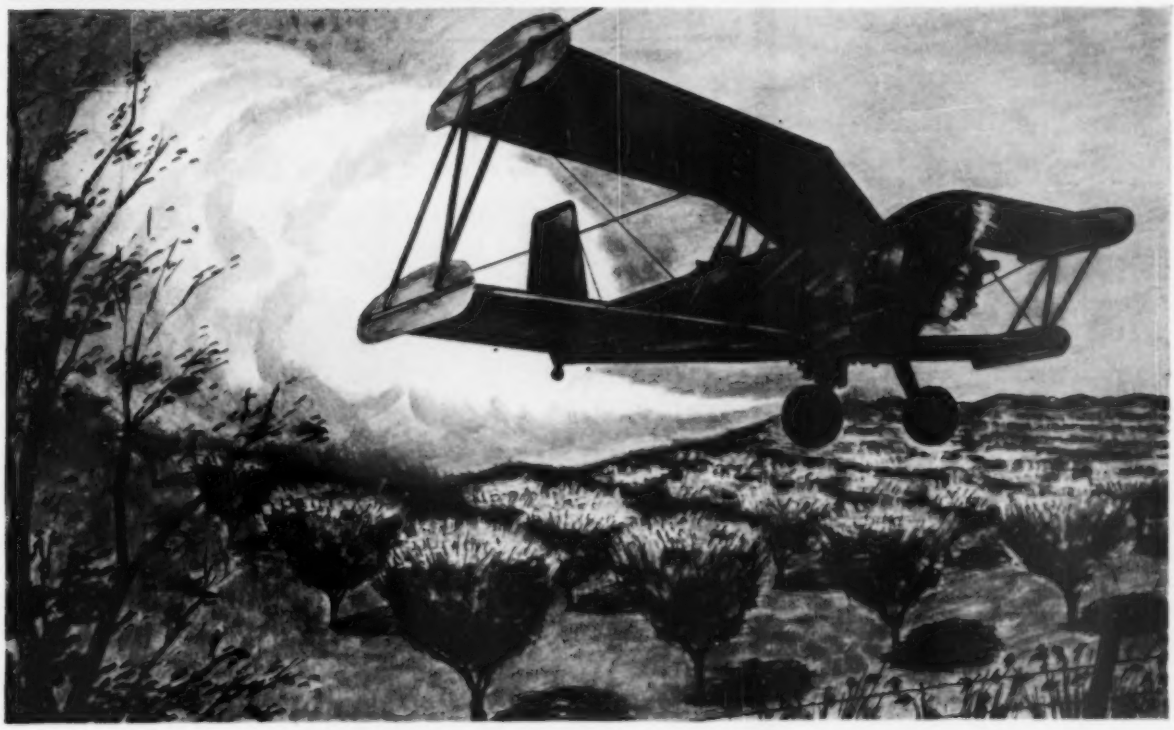

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SUBSCRIPTION RATES: One year U.S. and possessions, and Canada $4.00; Pan American Union Countries $4.50; all other foreign countries $5.00.
POSTMASTER—Please return undelivered copies under Form 3579 to 64 E. Lake St., Chicago 1, Ill.

OCTOBER, 1954 VOLUME 55, NUMBER 4

FLYING

Reg. U. S. Pat. Off.

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THE COVER: The Horton HW-X-26-52 experimental plane as painted by Ed Valigursky. See page 45.

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Member of the Audit Bureau of Circulations

Ziff-Davis Publishing Company Editorial and Executive Offices, 366 Madison Ave., New York 17, N. Y. Branch Offices: 64 E. Lake St., Chicago 1, Ill.; Statler Center, 900 Wilshire Boulevard, Los Angeles 17, Calif.

SUBSCRIPTION SERVICE: All communications concerning subscriptions should be addressed to Circulation Dept., 64 E. Lake St., Chicago 1, Ill. Subscribers should allow at least four weeks for change of address.

CONTRIBUTIONS: Contributors are advised to retain a copy of their manuscripts and illustrations. Contributions should be mailed to the New York Editorial Office and must be accompanied by return postage. Contributions will be handled with reasonable care, but this magazine assumes no responsibility for their safety. Any copy accepted is subject to whatever adaptations and revisions are necessary to meet the requirements of this publication. Payment covers all author's, contributor's and contestant's rights, title, and interest in and to the material accepted and will be made at our current rates upon acceptance. All photos and drawings will be considered as part of the material purchased.

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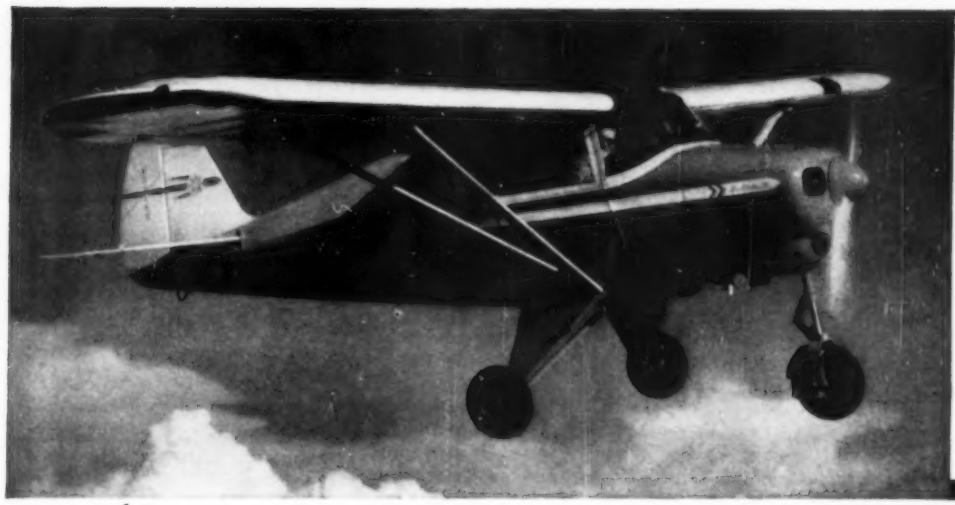

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That's why the U.S. Air Force selected the Marietta factory to build multi-engined B-47 Jet Bombers and C-130 Turbo-Prop Combat Cargo Planes. In the more than three years under Lockheed management, this Marietta plant has never missed a delivery schedule. And today, new cost and performance records are winning additional commendations from the USAF.

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NORTHERN HOSPITALITY

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we have a buzz code set up for them. One buzz: "Hi. Just flying by." Two buzzes: "Put the coffee pot on, I'm landing."

If the plane is on floats, the dock on the lake is only 200 yards from the front door of our log cabin. If on wheels, I drive two miles to the nearest local airstrip (population 30 families; two airstrips, hangar and A & E available), and pick them up, while our wood stove has the coffee pot whistling. If it's a jet buzzing (and they do), I just watch and wave.

As an avid reader of your magazine, I think every issue is better than ever. Looks as if I'll be an AOPA fan forever.

GLORIA MCNUTT

Naptowne, Alaska

AMEN

I wish to say "Amen" to your editorial of August, "The Oak and the Acorn." It is by writing such as this that we of the CAP eventually will realize the full potential that the CAP program has to offer to the United States. It is a shame, a crying shame, that such a situation has existed with such potentiality for such a long period of time. All of us who have been associated with CAP, for a long or short period, have felt the extreme frustration that comes from trying to produce so much with so little.

Many thanks again and I hope your editorial sows some seeds.

W. A. SHAFER

Erie, Pa.

As commanding officer of a good Civil Air Patrol unit, allow me to congratulate you on your splendid editorial: "The Oak and the Acorn."

Your comment on the senior members is wonderful. Let's get rid of the uniform-happy and "something-for-nothing" boys and with what would be left we could build a respected organization.

ALBERT G. WOLF

Staten Island, N. Y.

SINGLE ENGINE NIGHT FLYING

I have just finished reading "A New Look at Single Engine Night Flying" in your July issue. In my opinion it is far and away the best statement of facts I have ever read.

I am a Naval Aviation Cadet with 250 hours, of which 20 are night flying. My night flying consists of touch and go, full stop landings and cross-country. Our night landings are made with flare-pots instead of hi-intensity lights. Nine out of ten cadets find it easier to land with a minimum of light, and many prefer to have their landing lights off.

Anyone who has flown at night will agree there is no greater thrill in flying and certainly nothing which involves less work. The night itself is the biggest aid to navigators; many of the landmarks such as small towns and roads that you might miss during the day are outstanding at night. The absence of clear air turbulence gives the pilot more time to enjoy the flight and concentrate on his flying, thus having a more enjoyable and safer trip.

MARTIN E. SHERIDAN

Corpus Christi, Tex.

I want to tell you how much I enjoy reading FLYING magazine and especially the article, "A New Look at Single Engine Night Flying." Until reading the statistics in the article, I was one of those pilots who feared night flying because of engine failure.

My tour of duty in Korea has temporarily interrupted my flying, but when I return to the States I will be getting my night hours in, thanks to the author of the piece on single engine night flying.

A/1C JOHN A. KELLY

APO, San Francisco

(Continued on page 10)

FLIGHT SCHOLARSHIPS

● *An item in the June "Briefings" announcing the offering of flight scholarships to each of the nine high schools in Waukesha County, Wis., inadvertently credited the county to Illinois. The resultant correspondence brought the following interesting report of progress from Dale B. Crites, president of Waukesha's Spring City Flying Service.*—ED.

In the fall of 1953, on the 50th Anniversary of Powered Flight, the Spring City Flying Service, of Waukesha, Wis., decided to offer a flight scholarship to each of the nine high schools in Waukesha County. The course consisted of eight hours of dual flight instruction and 35 hours of ground training. The nine scholarship students began their course with a ground school meeting on April 1, 1954. The first student soloed on May 14 and the last student to solo completed his course on June 11. At the present time all the students are continuing their training and hope to obtain their Private Pilot licenses in the near future.

Before this scholarship was offered, there was very little interest in flying among the teen age group. Now there is definitely more enthusiasm being shown toward aviation. We believe that the future in aviation is all going to depend on this teen age group and therefore anything that is done to promote interest among teenagers is definitely for the benefit of aviation.

This spring we also had about 300 grade school groups visit our airport for an interesting tour and also a series of group rides. This was done to supplement their courses in aviation that were being studied at the time.

Dale Crites conducts a ground school course for flight scholarship winners, Tom Redfield, Earle Olson, Alan Luke, Robert Jandt, William Petsch, Bruce Paegelow, James Mitchell, Phillip Frischmann and John Tetzlaff.

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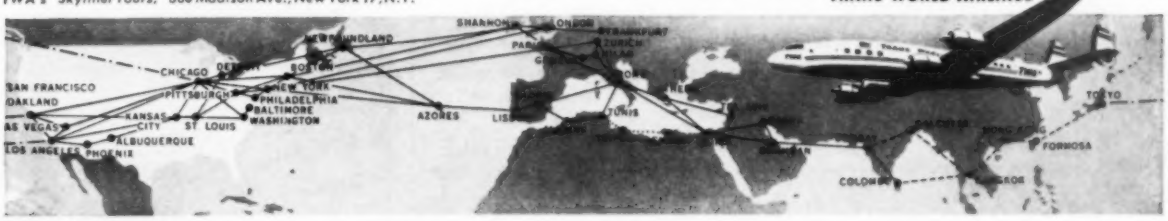

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MAIL BOX

(Continued from page 8)

RECRUIT

At my advanced age, on the late evening side of 37, I have decided to resign my regular commission as a Lieutenant Colonel in the Army and pursue the eagle into the "wild blue yonder."

My interest in aviation was rekindled in Germany by the accident of having a Light Aviation Section as an organic part of a Signal Battalion to which I was assigned; but you are partially responsible for this rather unusual state of affairs. Your magazine was available on Stars and Stripes newsstands, and

soon the bug which World War II had laid low, attacked me with new vigor. The disease is now chronic.

I have enrolled in the Business Pilot course at Embry-Riddle, as advertised in FLYING magazine, to begin 27 September 1954.

ALBERT T. SCHRADER

Eatontown, N. J.

● *Good luck, Colonel. Let us hear from time to time how you are getting along with the new course.*—ED.

SAILPLANE KIT AVAILABLE

In your MAILBOX column you have had many letters on home construction kits for modern aircraft. The Schweizer Aircraft Corporation has announced a sailplane kit, the all-metal 1-26, and is now actually building them on a limited production basis.

The glider is all metal construction (except some fabric covering) and all welding has been done at the factory. Also the wing sections have been fitted to the fuselage and pin holes reamed. This ship is in the high performance class, designed for 200 mile cross-country flights.

I saw the prototype at Elmira recently and it is a very sleek job with many improvements over the 1-23 (such as pull-tight canopy lock).

Price of the kit is $1,500, with a $250 down payment with the order. A brochure with more detail is available from the Schweizer Aircraft Corp., County Airport, Elmira, N. Y.

Let's see how many of your readers really want a low priced kit to build.

RAY W. JACKSON

Dearborn, Mich.

● *How about it, folks?*—ED.

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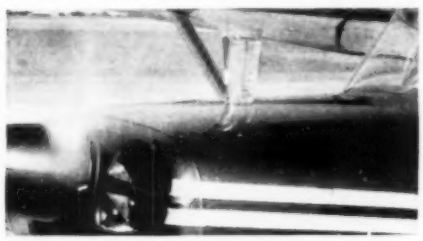

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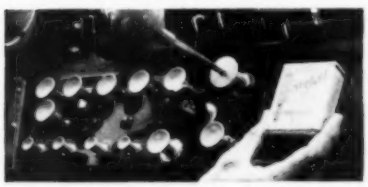

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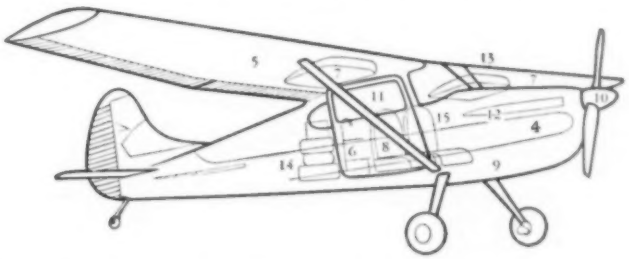

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FLYING
VOLUME 55, NO. 4
OCTOBER, 1954

AN EDITORIAL

OREB, ZEEB AND THE A.F.R.O.T.C.

IN THE LONG AGO there strutted a pair of characters named Oreb and Zeeb . . . the Kremlin boys of their day. They overran just about everybody and apparently had it made.

Then they ran into a group of young fellows led by a man named Gideon and were cut down to size. The only reason they rate mention in a FLYING editorial is that Gideon lopped off their heads.

As a matter of fact, we aren't particularly interested in Gideon himself, but rather in the group of young fellows he picked. To be very accurate, he didn't exactly pick them. They picked themselves. Gideon organized them and taught them their P's and Q's.

One day lately we were watching the campus of a great University fill with students returning for the beginning of another school year. We reflected that across the nation five million young men currently were crowding onto high school and college campuses. And almost as many young women were swinging along beside them . . . all very important people.

Here and there on the University campus we occasionally caught sight of a man in blue . . . Air Force blue . . . and knew he must be an Air R.O.T.C. student officer.

"There," I reflected to myself, "goes a young man who has picked himself for responsibility."

And so it was that our train of thought was led back to the cadre of self-selected youth with which Gideon met the aggressors of his day.

Gideon's boys were unique for their awareness. They knew they could achieve nothing personally unless their land, their institutions and their government had freedom and security. They surely sensed that love of freedom is the greatest of all romance. Such is the hall mark of young men and women who select themselves for responsibility in any age.

The ten million who are presently marching onto our campuses are free, as of now. But they are less secure in their freedom than they were a few short years, or even months, ago. Something was chipped away lately from their freedom when the youth of North Korea and of Indo China were abandoned behind the Iron Curtain. Something has been chipped steadily away ever since a free world began to compromise with its aggressors.

In fact if the ratio of freedom lost to aggression in the last decade, is maintained for another decade, our college songs of today are the dirges of a dying liberty.

Back at the turn of the 17th century, John Donne, a young veteran who became a world famed philosopher, voiced his reason for electing himself to responsibility. Said he, "Any man's death diminishes me, because I am interested in mankind . . . never send to know for whom the bell tolls. It tolls for thee!"

The youth of Donne's day made themselves strong in seamanship because control of the sea was in those days the way of world peace and British security. So the self-elected ones turned back the Spanish Armada and set the stage for constitutional government.

The Air Force R.O.T.C. of today is more than an organization. It is a philosophy authored by some 150,000 young Americans, to assume responsibility for civilization in a challenging and decisive field of action. It is realization by the best of our young men that national security is basic to personal opportunity. And at the same time it is a vivid indication that our system of broad public education can rise to serve something more than mere academic purposes.

It is not enough to *think* airpower. Somebody must *be* airpower. Gideon's young men were not a very great proportion of the crowd. Men of action are never in the majority. Numerically the Air R.O.T.C. cannot guarantee freedom to mankind but spiritually it points the way and sets the course. The crowd will follow in time to smite the columns of Oreb and Zeeb.

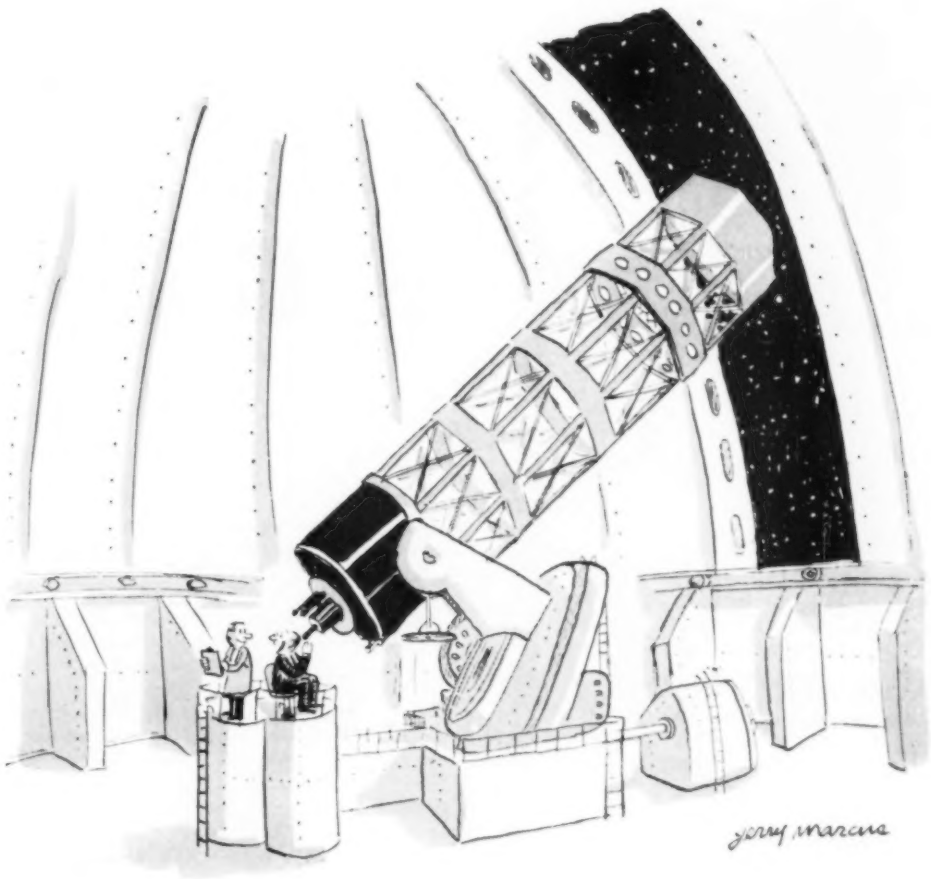
It may even be that no smiting will be necessary if free American youth prepares itself in full proportion to master the air ocean. Currently, the weight of United States atomic power could be delivered on targets involving some sixty million Communist population. The Kremlin can not gamble on victory under these circumstances. The Kremlin must exercise patience.

But this patience can be made of no avail to them if the margin of air superiority in the free world is maintained or increased. History teaches that those with power to enforce peace will have peace.

If the spirit of responsibility for peace thrives on the campuses of America in an ever increasing R.O.T.C., it will surely turn out that the Maos and Malenkovs are as insignificant as have become Oreb and Zeeb.

Gill Robb Wilson

Gill Robb Wilson
Editor and Publisher



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General Clair Chennault has a touch of genius in both respects.

VOICE

From a background of 17 years in China, the Flying Tiger brings fact and realism, rather than theory and fantasy, to the problem of United States policy in China.

As reported by
TOM McCLARY

Q. What is the most alarming aspect of the Asian situation?

A. That America fails to realize to what extent control of the Pacific rests in Asia. Upon Asia depends our national security. Stalin said, "The way to Paris is through Pekin."

Q. Control of the Pacific largely rests with U.S. Strategic Air Command, based at such points as Okinawa, and Guam. Is that situation in jeopardy?

A. It will be if Red China is accepted in the UN and creates new satellites.

Either we concentrate on the core of the trouble—Red China—immediately and decisively, or we can anticipate the communizing of all Asia, as boasted by Molotov and Mao; the gobbling up of our friends, Chiang Kai-shek and Syngman Rhee; the complete loss to us of Asia's open ports and vital supplies; and exclusion from future Asian trade. We will be isolated commercially, diplomatically and militarily between the European and Asiatic pincers of Soviet Russia. Communist control of Asia would make possible a line of Soviet communications, fuel dumps, and air bases extending from within the Arctic circle down to Indonesia, and westward to India. Such a situation would force the Philippines and Japan into the Soviet orbit, isolate Australia, and drive the perimeter of our Western Defenses back to Hawaii.

Q. How immediate do you consider the threat to our security?

A. Critical.

There is no longer excuse to suppress the Wedemeyer report. The whole of it should be made public so that Americans may learn what the Soviets already know . . . that our vacillation and lack of an Asian policy has fostered the sweeping tide of Communism in China, and other Asian nations.

The threat of an all-Communist Asia has now reached such proportions that if we fail to form realistic decisions and put them into immediate effect, we will find ourselves hopelessly checkmated.

Q. What crystallized the crisis so suddenly?

A. The fall of Dienbienphu and the switch of French policy without consultation with us brought the picture into sharp focus.

Editor's Note: *Airpower has re-oriented our perimeters. Europe, disunited, buys us no time. Africa and Asia merge our perimeters. American foreign policy must steer by those stars. But it can not drift . . . it must steer. We sent a reporter to ask a great airman and patriot, the Orientwise Flying Tiger himself, Clair Chennault, his idea of a sound Asian policy.*

OF THE TIGER

Our pouring of two and a half billion dollars into French Vietnam aid was futile from the outset. No possible Asiatic gain could accrue to us. Even the Anti-Communist Vietnams were half hopeful that the French would lose.

Had we given Chiang Kai-shek the same aid during the same period, there would have been no fall of Dienbienphu. First, Chiang would have created a distraction by pulling off Mao's armies from aid to the Vietminhs. Second, with Chiang's banner again unfurled on the China mainland, the Vietnams would have been inspired with sufficient hope in an ultimate free Asia to throw themselves into their own defense. This opportunity still exists.

Q. *Did we not make it clear to the Vietnams that we were committed to their freedom?*

A. You have to look at that through Asian eyes. At the end of World War II, we were committed to the complete restoration of a free China. Our first move was to give Manchuria and the vast war spoils of the Japanese arsenals to the Soviets.

We were then committed to support Chiang Kai-shek's campaign for a free China. Arbitrarily and without notice, we withdrew our support just when Chiang had the Communists licked. He was abandoned to his own fate and fell back upon Formosa.

We were committed to establishment of a free, democratic Korea. First we started to pull out. Then we moved back for the "*victory*" of the UN "*police action.*" We bathed the 38th parallel with American blood for no necessary reason. Then after a "negotiated" peace, we prevented Syngman Rhee from unifying his ancestral land in the only way possible.

Meantime, we made friends again with Chiang, a very circumscribed friendship. Although extending him economic aid and military advice, we have prevented him during four years from attempting re-establishment of the Chinese Government we recognize, over the lands we recognize that government represents. Not one American dollar, not one iota of instruction, not one pound of supply extended to Chiang has been of an offensive military nature. The planes we have supplied are mostly craft he cannot use in combat against MIGs. All armaments given him have been purely defensive armaments.

Knowing these things, as all Asia does, what would you expect the Vietnams to hope from us, particularly when we were aiding the hated French colonials and not using any real pressure on the French to give Vietnam its promised freedom?

Diplomatically, we have completely disregarded the importance of Asia itself to us. Our moves in Asia have been nothing more than bargaining weights of our European and UN affiliations. Our reward has been a kick in the pants from two of our strongest European allies; loss of respect throughout Asia, India and the Moslem world; and now the threat of a Communist pincer while our allies flatly tell us they mean to play ball with Red China, which in effect, means Soviet Russia.

Q. *Would you favor armed intervention in any form?*

A. Flatly, no, until it is necessary, which is not the case if we appraise Asia with realistic self-interest and avail ourself quickly enough of the patriotic policies of Chiang Kai-shek, Syngman Rhee, and other anti-Communist national leaders.

First, I do not believe it possible to intervene with armed forces in a limited sense.

Second, we might easily bring on the very world war we are trying to avoid.

Third, we'd receive no love for our intervention. Even anti-Communist Asia is aflame with the fire of *Asia for the Asians.* It will accept help, just as we did from Lafayette and Pulaski, but it does not want any Occidental race using its soil for their own wars, or again trying to run Asia's wars.

Fourth, our intervention is utterly unnecessary. Chiang and Rhee both have veteran fighters fired with patriotism and hate of the Communists, and eager to fight for the freedom of their homeland.

Q. *You see no hope that a combined UN action might assure a negotiated peace?*

A. You can't do business with a totalitarian power. That was true of Hitler, Tojo and Mussolini. It is as true of the Kremlin and Mao.

Furthermore, the UN action in Korea is in great part responsible for the situation now.

Clearly, our self interests are in many ways opposed to those of our European allies in (*Continued on page* 64)

1

Experimental Aircraft

in response to a new surge of interest in aviation, are again being built at home by "genius in the back yard."

By LEO J. KOHN

THE GRASS ROOTS AGAIN are astir with the activities of experimental aircraft builders. The movement has reached such proportions as to produce a thriving and enthusiastic organization, the Experimental Aircraft Association, headquartered at Curtiss Wright Airport, Milwaukee, Wis.

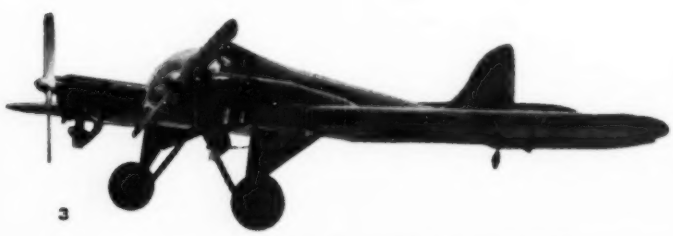
Although founded as late as January, 1953, EAA has a membership in excess of 500, publishes its own house organ, and has won the affiliation of the Professional Race Pilots Association, led by the famed S. J. "Steve" Wittman. Paul H. Poberezny, ex-Air Force officer, engineer and stunt pilot, heads EAA and reports that membership is being extended to numerous applicants from foreign countries.

The Association embraces experimental aviation in all of its phases . . . sporting, aerobatic, and racing craft . . . agricultural design . . . reconstruction of antiques . . . utilitarian modification of conventional types . . . kit assemblies . . . anything in airframes, power plants or flight accessories which fall in the experimental category. Nor is membership restricted only to builders and pilots, but extends to students and patrons of the arts as well.

A number of factors have combined to foster the current surge of nation-wide experimental activity.

Primary factor is the urge of the grass roots airman to solve for himself the problem of the high cost of flying. During the past year, EAA has received more than 20,000 letters from airmen far and near . . . the vast majority of them seeking guidance in planning or building of craft at costs within range of the writers' pocketbooks. EAA maintains a technical committee of experienced members to assist experimenters with problems beyond their capacity.

A second factor basic to the surge of experimental activity is the enthusiastic cooperation of the Civil Aeronautics Administration, not only in liberalizing former restrictions, but in giving practical help and lending a sympathetic ear to the problems encountered by the experimenters. The field force of CAA has recognized the philosophy of EAA in guiding the experimental movement along lines of safety and practicality over and above mini-



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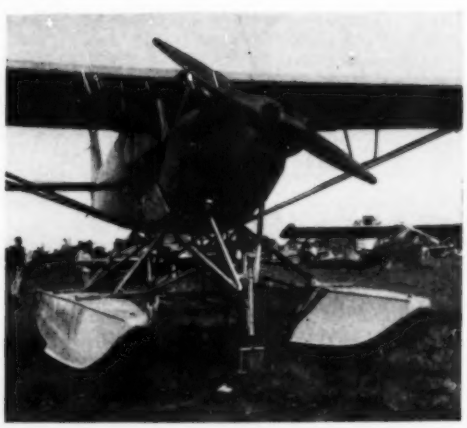


The amphibious Piper *Cub*, owned by Larry Gordonier of Vero Beach, Fla., has made many successful landings and take-offs.

Above: "Yellow Jacket" in formation flight with "Little Audrey," built by president of EAA, Paul Poberezny.

1

Popular Knight *Twister* with 85 hp engine is owned by E. O. Sundelin of Valparaiso, Ind.

2

Steve Wittman's "flying carpet," a little two-place, 85 hp sport plane, has top speed of 185.

3

"The Belly Flopper," a very unorthodox twin-engine plane built by Irven Miller of Milwaukee, is flown from prone position. Powered by 40 hp Continentals, it has top speed of 150.

4

This fast, 85 hp midget racer, "Tater Chip," built by Ned Kensinger of Peoria, Ill., has attained well over 200 mph in level flight.

5

Modified Piper *Cub Cruiser* used for aerial photography by George Gruenberger. Wing tip plates have been added to shortened wings and aft section of fuselage has been cut down.

5

4

mum standards permitted by regulations. In consequence, the forces of ingeniousness and those of regulation are met on common ground rather than at sword's point.

Not to be discounted as a factor in the experimental trend is a brand new crop of youth which, wearied with the limitations of "hot rodding" and seeking a challenge of more mature proportions, is turning to the field of aviation. These lads are finding that they can pick up an old plane cheaply and, by scrounging here and there and supplying copious sweat of their own, put it in safe and serviceable condition. Still others want to tackle original construction from plans or kits. All find a welcoming hand from EAA.

First attempt of EAA members to get together in a nation-wide pow-wow was made in conjunction with the 3rd Annual Wisconsin Air Pageant in 1953. Twenty-two of the membership arrived at Milwaukee in their own experimental ships. The symposium conducted around these craft proved a rich source of information for the audience. The Fly-in of the EAA this autumn slated some 75 experimental craft for exhibit and analysis. To encourage EAA, numerous local suppliers and operators across the land have made discounts to home builders and have furnished valued information on the location of old models and materials which can be picked up cheaply.

Paul H. Poberezny, President of Experimental Aircraft Association.

Of course, within the ranks of the experimenters are many who are anything but amateurs . . . nor is cheap flying an objective with all. Just as the big game hunter will spend thousands of dollars for a single coveted trophy and plan for years on a single safari, so the wealthy home builder may go into a project of aircraft design and construction which meets his unique ideas of an ideal plane.

Other experimenters might be classed as engineering prospectors. Testing ideas here and there, they come upon nuggets of formulae and fact which justify personal pride. "Steve" Wittman has designed six different racing craft. Ray Stits has specialized in tiny airplanes with three brilliant models. Dr. Torrey of Illinois has made available the *Midget Mustang*, a small all-metal ship.

Larry Gordonier built a tricycle retractable landing gear for his float-equipped *Cub*. He flew it from Vero Beach, Fla., to Milwaukee in 1953 to attend the Fly-in.

Bruce Pitt of Milwaukee and his father, built a small 85 hp sport plane which is very successful. With only a 14 ft. span, it can get into and out of the smallest operational field.

Larry Farnham of Fort Collins, Colo., has built a utility plane with all controls incorporated in a motorcycle handlebar. The pilot sits astride the airplane . . . a very novel, but successful, idea and more of the type are certain to be built.

Neal Loving, builder of an inverted gull-wing midget racer, flew his ship to Kingston, Jamaica, last winter. The trip covered 4,000 miles, (with 500 miles over open water) and cost Loving less than $100.

It is a historic fact that the origins of flight are rooted in homespun ingenuity. Formal aeronautical education and organized industry contributed little to the pioneers. That the latter have now become so vast has tended to obscure the former. Yet the creative imagination of a nation can never be contained in academic halls or organized factories. Hence the experimenters feel that their activity soundly must be judged a part of America's effort on the air frontier. END

A · F · R Mold

By BRIG. GEN. M. K. DEICHELMANN

Commandant, Air Force ROTC

INTRODUCTORY to a projected series of articles by men of the Air Force Reserve Officers Training Corps, FLYING has asked me for background description of the organization.

More than 125,000 physically and mentally qualified young men are organized in 188 detachments at 207 colleges and universities in the United States, Hawaii and Puerto Rico. AFROTC is the largest educational program under centralized control in the United States.

Headquarters Force of AFROTC, The Air University, Montgomery, Ala., numbers 240 officers, airmen and civilians. Stationed on various campuses throughout the nation to administer the program are 2,800 Air Force officers and airmen.

For administration the United States is divided into 10 areas, with approximately 18 ROTC units in each area. Operating from ROTC headquarters are 10 teams of officers, each team responsible for liaison with the 18 colleges and universities within its specific area.

Why is such a far-flung program needed by the Air Force?

Because the Air Force is in the forefront of a technological revolution which has produced basic changes in historic methods of defense. Science and industry provide top quality aircraft. No similar system automatically furnishes top caliber personnel to operate them. The urgent need for such can be met only through a comprehensive officer training program. Eighty per cent of these officers must be furnished by Air Force ROTC, beginning 1955.

Why was it logicel to assign AFROTC to the Air University?

The University was conceived at the close of World War II. At that time the Air Force had no educational system for its officers. Yet it needed officers with much broader horizons than those formerly considered essential to the military man. It was no longer sufficient for him to be solely an expert military technician. His fund of knowledge had to fit global space. The Air University was established to chart a new course in breadth and depth of progressive education for the Air Force officer.

To explain where the AFROTC fits into the picture, a briefing on the Air University may be helpful.

The University comprises a unique group of schools and colleges with courses as diverse as the subject of aviation itself.

· O · T · C

for leaders

General Deichelmann

A new course is charted for education of the Air Force officer.

The Air War College is the top level school of the University. It is devoted to the higher education of officers carefully selected for their potential in high command and staff duties.

The next school in this system of progressive education is the Air Command and Staff School. It conducts two general courses for future commanders. The Field Officer course develops ability for command of intermediate Air Force units and principal staff jobs with major units. The Squadron Officer course is basic in the system for officers of one to five years service, and prepares them for command of the basic operational unit . . . the squadron. Additionally, the Air Command and Staff School conducts eight specialized staff courses in such fields as logistics, communications, and intelligence.

Other schools under the Air University are the USAF Institute of Technology, the Air Force School of Aviation Medicine and the Extension Course Institute. In addition, there are various research agencies engaged in fields which directly or indirectly bear upon Air Force problems.

The system just described is in reality a group of graduate schools. In relation to them, AFROTC is the undergraduate program . . . the first phase of preparing future officers for the Air Force.

Authority to establish an ROTC at civilian institutions was first provided in the National Defense Act of 1916 as amended. ROTC program is not new. It is just re-oriented to the air age and new at the Air University.

Air Force ROTC got under way in 1946 at 78 different colleges and universities Several years later came the grave world situation. Congress authorized increase in the Air Force in hope of preventing another global war. This necessitated an increase in the source of officer procurement. So, in 1951, the ROTC program was expanded to its present strength.

AFROTC was formerly administered by Continental Air Command and its four numbered Air Forces. In August, 1952, administration was transferred to the Air University. This move signified a new milestone in AFROTC progress. For the first time the affairs of AFROTC are guided by a separate and distinct agency which devotes its entire efforts to this task.

An entirely new, four-year curriculum for AFROTC was inaugurated in 1953. Its objective is to produce an educated and basically competent second lieutenant. The former AFROTC course consisted of specialized options covering eight career fields in the Air Force. It permitted a student to take special training most nearly parallel to his regular college studies. After considerable evaluation, the Air Force eliminated the specialized options. They were failing to train cadets comprehensively in the many attributes required of an officer. Nor were they providing sufficient training in the specialized subjects.

The Air Force consequently made three basic decisions. First it determined on a general military education to supplement the college's academic education. Second, it decided that specialized training of Air Force officers would be the responsibility of the major commands established for this purpose. Third, it re-oriented the AFROTC program to produce more applicants for flying training. By use of new selection criteria, cadets entering the advanced course in their junior year are chosen for their potential to absorb special training, especially flight training following college graduation.

This trend toward generalization of military training which will produce, first of all, an officer, has been followed by both the Military and Naval Academies, and has been recommended for the proposed Air Academy. Now, it is being adopted by the Air Force ROTC program.

The basic AFROTC curriculum consists of introductory material on aviation, the Air Force itself, and the world situation. Some subjects in this group are: Introduction to Aviation, Fundamentals of Global Geography, International Tensions and Security Structures (such as NATO and the UN), Elements of Aerial Warfare, and Career Opportunities.

In the advanced course, the college junior and senior delves more deeply into the organizational machinery of the Air Force. His subjects include, The Commander and His Staff, Problem Solving Techniques, Human Communication, Correspondence in the Air Force, Military Law, Courts and Boards, and Applied Air Science.

In his senior year, the cadet studies the Military Aspects of World Political Geography; the Use of Military Aviation; and the Art of War. During his entire four years of AFROTC, the student receives a heavy concentration of leadership training. He is given positions of responsibility within the cadet (*Continued on page* 69)

THE PRO'S NEST

Let's fly a new airplane

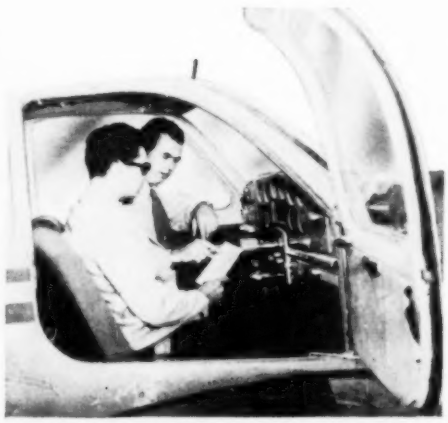
Some excellent pointers on making the transition from one type of plane to another.

By JOHN R. HOYT

LET'S VISIT THE airport today and check out in that new plane. It's fast, clean and attractive; it is also strange and unfamiliar.

Innate respect for something new is a healthy reaction, especially when it comes to airplanes. There are "musts" for every pilot to consider before he pushes a throttle in a model he has never flown. Changing from low to higher power, from single to multi-engine, or from landplane to seaplane is a thrill. Let's examine a few of those "must" items.

THE HANDBOOK: Every airplane has a manufacturer's Handbook, which varies from a small pamphlet in a lightplane to a thick volume for an airliner. Many pilots like to combine the Handbook with a checkpilot, but it is better to read the Handbook first. Read it through and learn all you can about the takeoff, climbing, cruising and maneuvering speeds. Learn about the important controls: throttle, mixture, props, fuel system, ignition, starting procedures, and emergency actions. You'll find such little gems as the fuel octane and oil weight to use and the authorized take off and landing weights. Placarded limits for weight-and-balance in passenger and baggage compartments are important for future flights. Be sure to check precautionary measures such as carburetor heat, cylinder head temperature regulation (cowl flaps). and operating oil temperature (oil by-pass). The Handbook for a lightplane is not this complicated and won't take much of our time, but remember that, as an airplane becomes cleaner and more powerful, the items that occupy a pilot's attention become more numerous. They also become rather vital: in a popular twin-engine aircraft the cabin heat and the oil-bypass are only a few inches apart and have identical handles . . . pulling the oil bypass will *not* heat the cabin and such an error *might* burn up an engine!



Going over the check-off list prior to takeoff.

THE COCKPIT: Get into the cockpit and sit there for a reasonable length of time. This doesn't mean to "just sit there," however, because the time should be spent in intensive study. Learn the location of the airspeed, altitude, tachometer, and manifold pressure gauges so well that you can close your eyes, think of the gauge, and find it instantly. How long it takes to become familiar with the cockpit depends upon the individual pilot and the complexity of the airplane. Before checking out its pilots in a certain multi-engine transport, one airline requires them to put in many hours of cockpit study.

Apply the knowledge gained from the Handbook and go over the cockpit. Know without any doubt your procedures; starting, takeoff, cruising, and landing. In other words, don't put off learning them until you get in the air, at which time you have your hands full. Learn them at ease, on the ground. Locate and use the trim tabs, cowl flaps, landing flaps, radio switches, battery switches, generator switch, and other components. Locate (but do not use!), the landing gear control switch or lever.

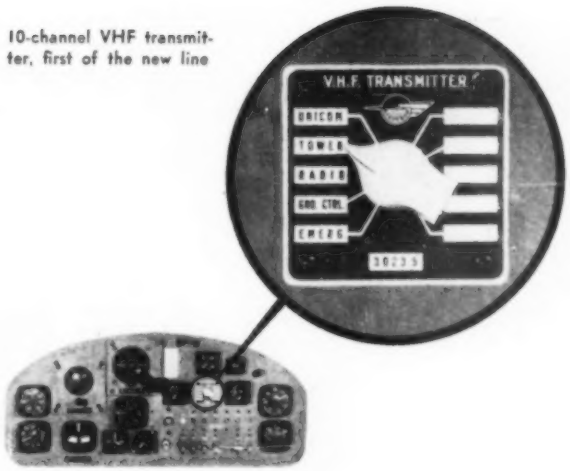
Now go through a simulated takeoff, using recommended procedures. Pretend to open the throttle, get the power set, the correct airspeed, gear up, climb, trim the plane, and level off. Go through a simulated emergency such as fire, forced landing, single engine, or running dry on one tank. If your reactions are slow or unsure, remember this: you won't do any better in the air when you both have to fly and think than you are doing on the ground!

THE CHECK PILOT: Ask the man who owns or flies the plane, "What's she like?" Find out characteristics during takeoff, in a stall, in a glide, and during the landing runoff. Does she tend to ground loop? How are the brakes? Does the carburetor ice up easily? Get his recommendations and suggestions, but be prepared to evaluate them later in order that you may possibly improve upon them.

It is always better to take someone's comments and be prepared to evaluate them than it is to pay cash for an avoidable mistake after making it yourself. And, although no owner wants to let you go out solo in a strange plane without a check flight, let's imagine this is a single seater and we have to make our first takeoff alone.

THE FLIGHT: Using the check-off list, start the engine, warm it up, get radio clearance, and take off. Apply power slowly, gradually and surely, feeling any tendency of the plane to swerve because of torque or cross-wind. Guide but do not force the plane into takeoff attitude and get off the ground precisely at takeoff airspeed by flicking the eyes quickly from the runway to the gauges and back. Lower the nose to get climbing speed and then climb at precisely the recommended speed. The gear may be picked (*Continued on page 62*)

10-channel VHF transmitter, first of the new line



Radio for all

is the goal of Aerotron,
a promising new name in radio.

By C. L. HAMILTON

WITH private aircraft flying three times the hours and twice the plane-miles of domestic scheduled airlines, it is pretty obvious that radio equipment has a big part to play in the whole show. Yet only about half of the 60,000 active private aircraft in the United States are equipped with some type of radio, and several thousand of these have receiver only.

Basic obstacles to increased radio use are: cost, weight and maintenance. As more pilots try to get more utility out of their planes, all three of these hurdles stick out like sore thumbs in an otherwise promising picture.

Down in Raleigh, N. C., a group of radio and electronics engineers are doing something about the situation. Their company, Aeronautical Electronics, Inc., has announced a complete line of low-priced, light-weight, easily maintained radios including transmitters, receivers, omni and ADF. Air Associates, largest of the aviation supply houses, will distribute the equipment through its nationwide branches.

First unit on the market is a 10-channel VHF transmitter weighing eight ounces. Priced at $79.50, Aerotron Model 200 comes equipped with five crystals for Tower, Range, Grand Control, Unicom and Emergency frequencies. Five additional crystals may be installed at $7.25 each. Antenna with installation kit costs $10.50.

The entire unit can be installed in a matter of minutes and, since it is only 2¼ inches in diameter, fits a standard instrument space. It operates on 6, 12, or 24 volt systems. All panels are easily removed for inspection.

In the Aerotron works and soon to be marketed is a "poor man's" ADF, weighing less than five pounds and retailing in the neighborhood of $150. In flight test stage is a VHF transmitter-receiver, with low frequency receiver, 75 mc marker beacon, and provision for both omni and ADF. It has more crystals than most pilots know what to do with. It weighs less than 10 pounds and the price will be within range of the average pilot's purse.

A rugged unit that could revoiutionize flight instruction is called "Tower Guard." It provides intercom between instructor and student, and a tower receiver. Easily snapped into place, the only permanent installation is the whip antenna. It will team up with a portable ground transmitter by which the instructor may maintain contact with his student over a VHF training frequency.

These are only a few of the Aerotron line now in various stages of development but indicate the type of equipment to be expected.

When AOPA carried an announcement of the Aerotron line in its Newsletter, the company received letters of enquiry from all over the world—some even enclosing checks for purchases, sight unseen. There can be little doubt that a market exists for low-cost radio.

Charles R. Browning, president of Aerotron company.

But how about performance? There have been low-priced radios on the market before, but performance was weak. Aerotron unconditionally guarantees performance. FLYING checked with Mr. James Ashman, president of Air Associates, who countered our questions by suggesting we go down to Raleigh to see for ourselves. He was right. Aeronautical Electronics is an outfit you have to see to believe.

Located on Raleigh-Durham Airport, Aerotron occupies a new air-conditioned plant with a service hangar and turn-off strip from the main runway. It is one of the neatest, most ingenious production facilities this writer has encountered in 20 years of aviation reporting.

Key to the whole show is Charles R. Browning, president. One of the brilliant young electronics engineers responsible for such wartime developments as ILS, Browning was formerly engaged in research and development work with General Electric and Bendix. An active private pilot, he was very much aware of the need for dependable aircraft radio servicing.

Returning to his home State, he organized his own company in Raleigh, specializing primarily in the installation of aircraft radio equipment. Quality of service brought planes to his shop from all over the United States.

Talking with pilots about their radio needs and gripes, Browning ultimately concluded that the problems of cost, weight and maintenance would have to be tackled from scratch with an entirely new approach to radio design and production.

Space does not permit a detailed technical account of the research and development which followed. The procedure can best be described as throwing away the text books Not only did they design a line of simplified, low-cost radios, they designed many of their own machine tools and production techniques.

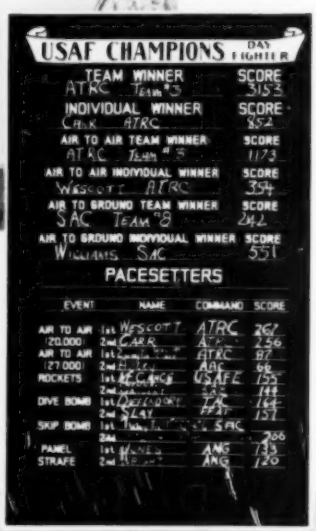
Not deterred by lack of skilled workers in the Raleigh-Durham area, Browning employed housewives whose manual dexterity in handling small, delicate crystals and wiring assemblies more than offset their lack of electronics production experience. In step after step of the highly complex production line, costly time-consuming operations were eliminated and ingeniously efficient methods and machines devised.

Nothing is impossible. Radio for all is a reasonable goal and one which appears to be attainable. END

GUNNERY

Crack fighter bomber teams compete in the first all-jet gunnery meet to assist the Air Force in evaluating latest techniques and weapons.

By LT. ROBERT A. HATCH

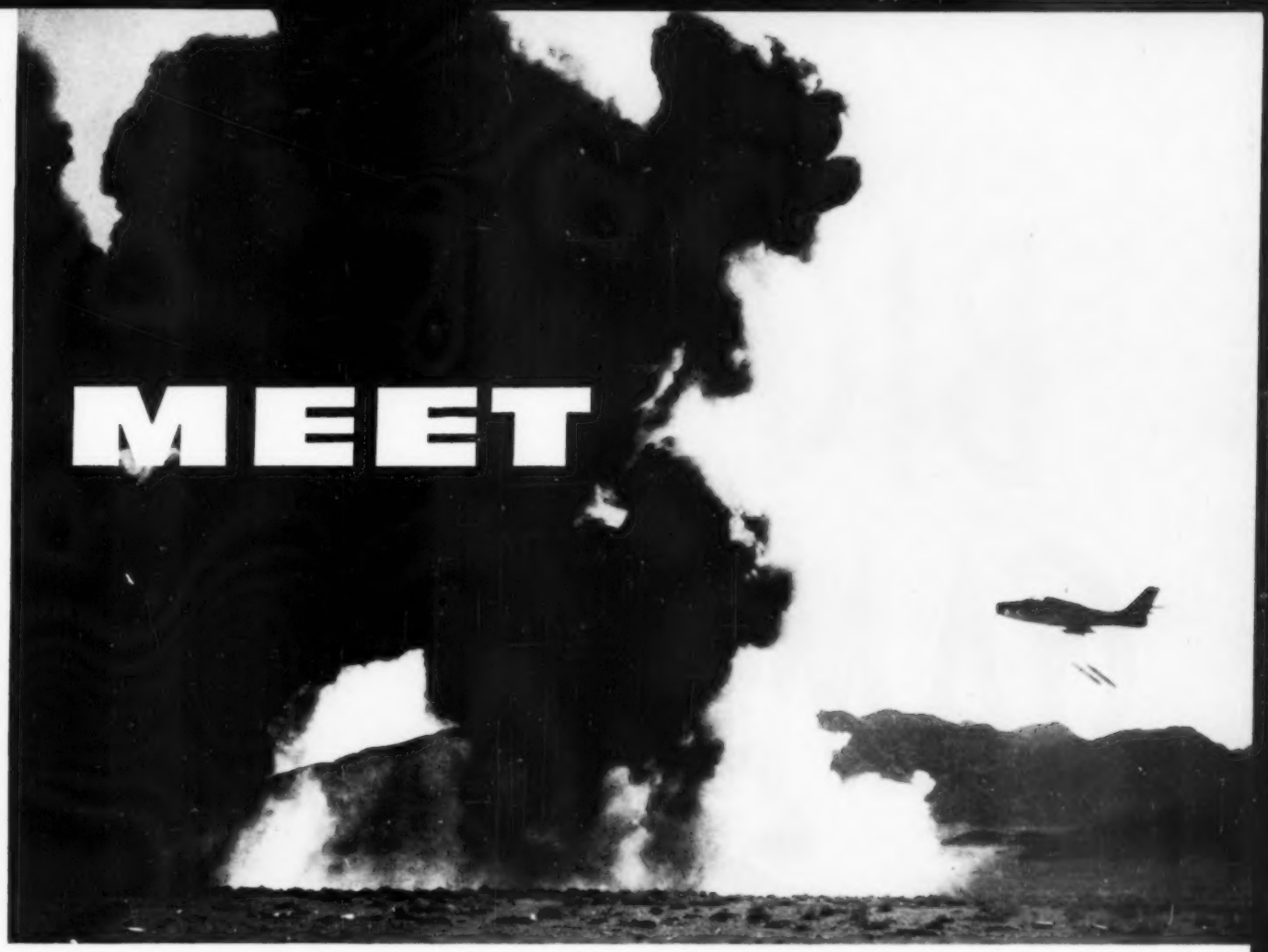

USAF CHAMPIONS DAY FIGHTER
TEAM WINNER SCORE
ATRC Team #3 3153
INDIVIDUAL WINNER SCORE
CHAK ATRC 852
AIR TO AIR TEAM WINNER SCORE
ATRC Team #3 1173
AIR TO AIR INDIVIDUAL WINNER SCORE
WESCOTT ATRC 354
AIR TO GROUND TEAM WINNER SCORE
SAC Team #8 242
AIR TO GROUND INDIVIDUAL WINNER SCORE
WILLIAMS SAC 551
PACESETTERS
EVENT NAME COMMAND SCORE
AIR TO AIR (20,000) 1st WESCOTT ATRC 267
2nd CARR A[illegible] 256
AIR TO AIR (27,000) 1st [illegible] ATRC 87
2nd [illegible] AAC 66
ROCKETS 1st [illegible] USAFE 155
2nd [illegible] [illegible] 144
DIVE BOMB 1st [illegible] FEAF 165
2nd [illegible] FEAF 151
SKIP BOMB 1st [illegible] SAC
2nd [illegible] 786
PANEL STRAFE 1st [illegible] ANG 735
2nd [illegible] ANG 120

Above: Col. G. L. Jones, winning team captain, accepts the Hoyt S. Vandenberg Fighter Gunnery and Bombing trophy from Brig. Gen. J. E. Roberts, base commander. Maj. Jack Wendell, information officer, assists. Right: Gunnery score board. Below: *Thunderstreak* drops napalm.

HOW GOOD IS THE U.S. Air Force fighter pilot? In time of war that's easy to answer. You tally up the combat box score.

In peace-time the job is a little harder. So for a full week last June, Air Force jets of various major commands, competed at Nellis AFB, Las Vegas, Nev. The Air Force set a peace-time measuring stick against its tactical and strategic jet craft in the first world-wide, all-jet Gunnery and Weapons Meet.

Twelve top daylight fighter and fighter-bomber teams, flying F-84's and F-86's, compared their relative skills in 14 air-to-air and air-to-ground events. Represented were teams from Strategic Air Command, Tactical Air Command, Far Eastern Air Force, Northeast Air Command,



Alaskan Air Command, United States Air Force in Europe, Air Training Command, and the Air National Guard. All teams had survived stiff elimination contests within their own commands before traveling to Nellis.

Each morning various teams took to the air, some to pommel a 6 x 30 foot target, towed behind T-33's at 20,000 and 27,000 feet. Entrants in these air-to-air events fired "free-style" and "radar" in sets of six passes, each throwing 400 rounds of .50 calibre ammunition each mission.

Other teams flew north to the three and a half million acre Indian Springs gunnery range, where they zeroed in on various air-to-ground targets in rocket firing, dive and skip bombing and panel strafing.

In addition to sizing up the capabilities of its various units, the Air Force was also looking for the best method of spending its aerial defensive dollar.

During and after the meet, evaluation of the latest training techniques and weapons was carried on by high-level observers. They were looking for possible modifications in tactics and aircraft. For instance, a change in the curve of pursuit (attack approach of an aircraft on target) made by one of the contesting teams could be rendered more effective as a result of radar evaluation. Maybe some team tried an idea which proved successful and could be picked up by other units.

When scores were added at the end of the week, the shoot turned out to be a home-team triumph. Nellis had trained the pilots who won a 14 to 1 victory over the MIG in Korea and boasts a lot of Korea veterans on its instructor staff. An ace-heavy Nellis team, representing Air Training Command, walked off with top honors, having a total of 3,153 out of a possible 5,600 points in the combined events. They won the air-to-air event and three top individual honors, plus the Gen. Hoyt W. Vandenberg trophy—a rotating honor that goes to the winning team. In all, 31 of the meet's 92 trophies went to the Nellis contingent.

The 508th Strategic Fighter *(Continued on page 67)*

Col. George L. Jones (right), Nellis Training Group Commander, with his winning team. Left to right: Maj. William H. Wescott, Capt. Warren H. Rice, Capt. Robert T. Latshaw, Capt. Charles C. Carr and Maj. Frederick C. Blesse. Team was selected on competitive basis.

BIG GAME

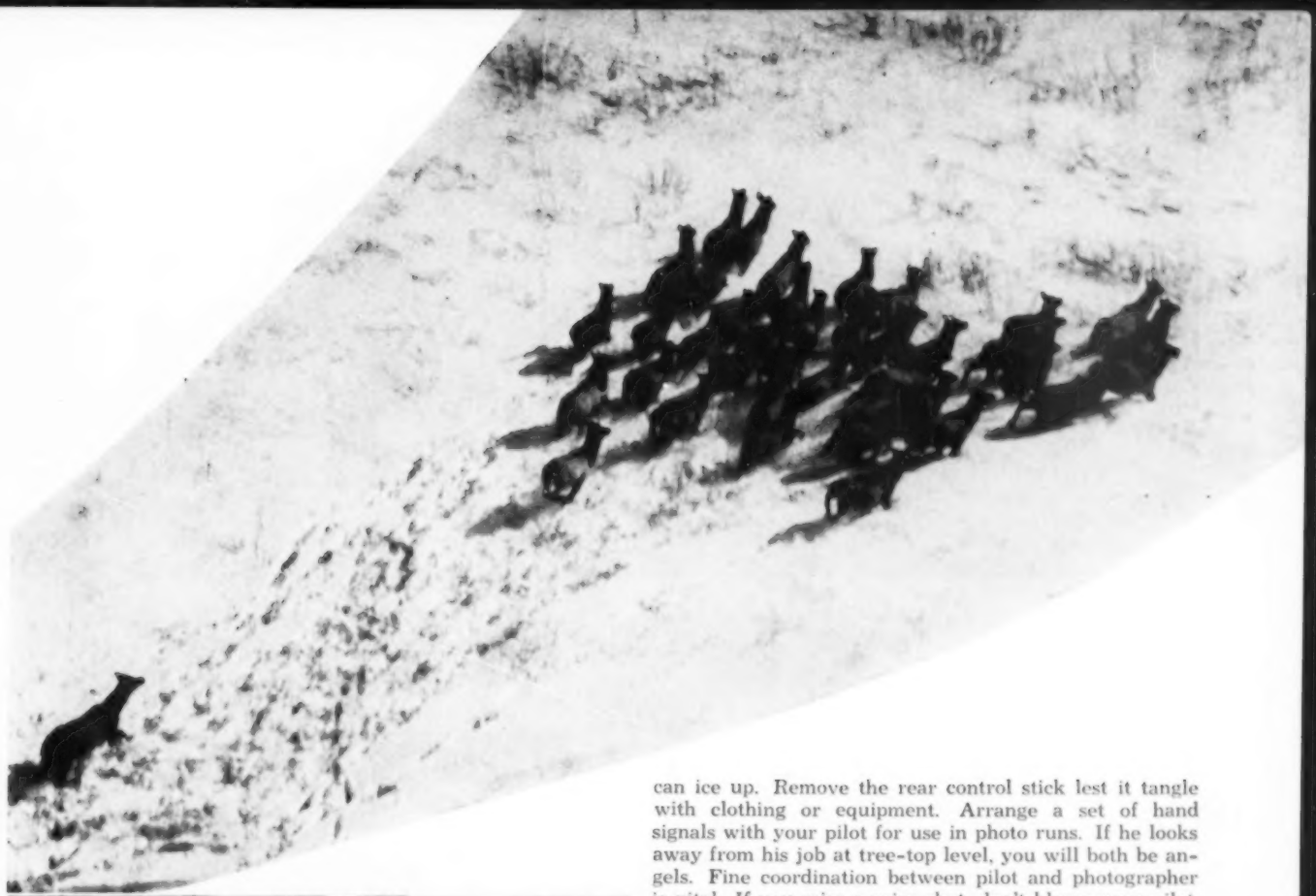
Above: Probably the lowest altitude closeup of an elk ever taken from a plane. Across two pages: A group of more than 35 elk, herded together, fleeing from photo plane. Center, opposite page: Fast Super-XX film is used at 1/1000 second to "freeze" a moose on the move.

Shooting effective aerial closeups of wildlife when snow makes game more easily detected

By WALTER WETTSCHRECK

AS PHOTOGRAPHER FOR Minnesota's Conservation Department, "shooting" big game from the air is part of my job. If the hunter thinks he has fun stalking the big fellows, he would revel in the association I have with them. To see a bull moose rear up and paw at you as your *Cub* slips past a few feet over his head is a picture you remember. To parallel a fast-running elk so close you can count his whiskers, and get his portrait in the process, is thrill enough for any outdoors man.

For practical purposes, my photographs are the documents from which the game count is more accurately computed. And actually the work of wild life photography is a two man proposition . . . a skillful pilot and a lucky guy behind the camera. The pilot who frets at flying down among the stumps has no business counting noses in the wilderness. We often scrape our skis on tree tops and thickets and not infrequently go under the branches to stir up animals which may be loitering there. I've learned the inviolate rule of keeping my face inside the plane through the painful process of getting it slapped by branches. One takes physical beating enough from the sometimes vicious cold and turbulence without butting his noggin on a limb.



Much of my big game work is during the winter when the snow blanket makes game detection easier. I never use telephoto equipment in the game count chore.

A high-wing plane like the *Cub* is good . . . low stalling point, power for quick pull-up. Easy to operate windows are essential. The less time windows remain open in extreme cold the better, since the cold moist air freezes film in the packs. Faulty windows cause many photo failures.

Double check everything before take-off. A small defect may cost your neck. Don't depend on gauges which can ice up. Remove the rear control stick lest it tangle with clothing or equipment. Arrange a set of hand signals with your pilot for use in photo runs. If he looks away from his job at tree-top level, you will both be angels. Fine coordination between pilot and photographer is vital. If you miss a prize shot, don't blame your pilot.

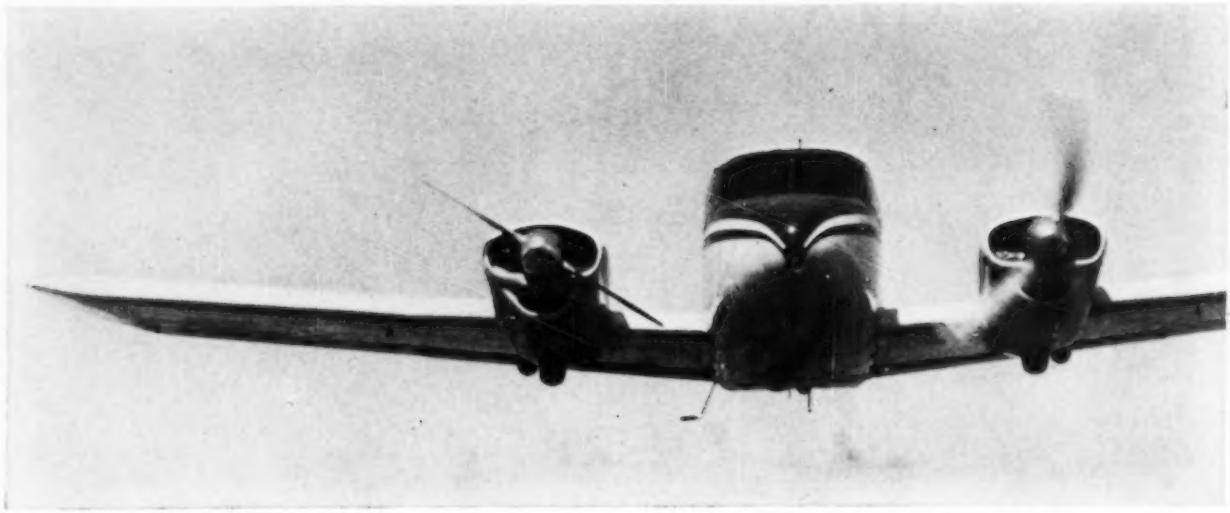
One of my best investments has been a small portable processing kit for developing films in the field. If trouble comes, I soon find it out. I know a fellow who made a wilderness trip and shot 144 exposures in three hard days flying only to learn later that someone had tampered with his camera. He didn't get a single picture.

Haze is no problem in aerial wildlife photography, since most shots are made below 100-ft. altitude. "A" and "G" filters, fine for the wild blue yonder, are of no use low down. On the average, we fly about 30 feet above an animal to picture the whites of its eyes.

Master film development before you attempt aerials . . . at least for a livelihood. Use all the speed built into the camera at all times. Remember that an aerial filter tends to throw off the conventional infinity setting, so focus your camera in the air with the filter over the lens.

Tips from hard experience might fill a book. Rewards beyond livelihood, only the fraternity of the great outdoors could ever know. END

Right: The author, an experienced wildlife photographer, (left) and pilot John Sorichak, about to make a flight over northern Minnesota.



Evaluation of the PIPER APACHE

The novice multi-engine pilot will find this

new, low-cost, light twin, with night and day utility, easy to handle.

By FRED J. BUNYAN

BEFORE FLYING THE *Apache*, I made a tour of the assembly line at Lock Haven, Pa., and filled in on the background of the ship. Over 1.25 million dollars have been invested in the type.

Briefly, it has a gross weight of 3,500 pounds. Useful load is 1,320 pounds. Cruising speed at 65 per cent power at 9,000 feet is 160 mph, giving a range of approximately 710 miles. The plane, fully loaded, can become airborne in about 900 feet and requires a landing roll of approximately 670 feet.

I was well pleased with the workmanship on this metal airplane. Piper employees have made the transition from fabric to metal very capably. Flush riveting has been used in approximately three-fourths of the aircraft. Engines are mounted at a good working level for mechanics. The cowling is easily removed. A lot of thought has gone into saving of maintenance time.

The writer is a production test pilot for North American Aviation. We asked him to report on the Apache along the same lines he would use in his regular duties.—ED.

The *Apache* has been designed to meet the need for a low cost twin with night and day utility. It is roomy for four places. A large shelf behind the rear seat is very handy. Two thicknesses of soundproofing have been used throughout and hold down the noise level. The windows have been blown to prevent vibration.

The *Apache* is powered by two Lycomings which develop 150 hp each at 2,700. The engines incorporate a crossover exhaust system with exhaust gases directed into jet augmenter tubes on the outboard side of each engine. This provides for exhaust elimination without power loss. Effective engine cooling is helped by the pumping action of the exhaust gases into the augmenter tubes, which draws cool air through the engine compartment. This eliminates the need for cowl flaps, thus reducing drag and permitting higher airspeeds. The extra thrust furnished by the exhaust augmentation helps to obtain higher airspeed.

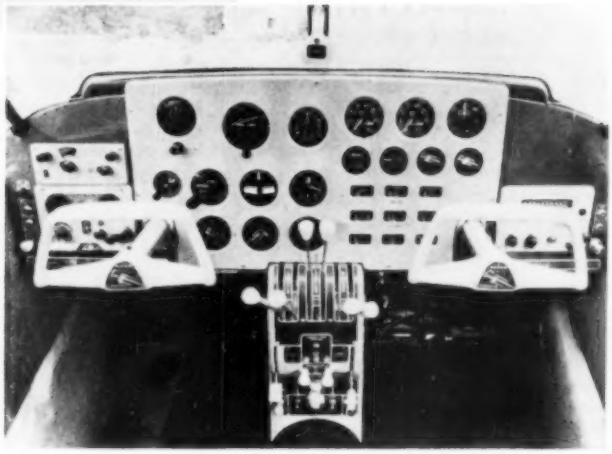
Aluminum oil coolers are mounted on the inboard sides of each engine. Quick oil drain valves are installed. Carburetor air is directed through quickly removable filters. Standard equipment includes Hartzell constant-speed controllable full-feathering propellers.

Two of us rolled the *Apache* from the hangar. Unlike most twins, which require a tow truck and operator for ground handling, two people can move the *Apache* about with ease.

I noted the easy step from the ground to the detachable mounting step, then onto the wing and down into a well appointed interior. Entering the cockpit does not require physical contortions.

The front seats are of steel tubing, with no-sag springs and foam rubber cushions. Upholstery is top grain leather and nylon frieze fabric. Seats are adjustable fore and aft. Both front seats can be removed easily. The rear seat area is convertible to a cargo compartment. All or half

Left: The *Apache* in flight with the right prop fully feathered. Below: The simple instrument panel and throttle pedestal.



of the rear seat can be removed in a matter of a few minutes.

The instrument panel and pilots' controls are simplicity itself. All flight instruments are directly in front of the pilot and mounted on a shock-proof subpanel. They are grouped in accordance with the generally accepted CAA arrangement. All engine instruments are located on the right side of the instrument panel. This particular plane was a custom model equipped with a Lear ADF, Narco *Omnigator* and Narco *Simplexer*. If the customer prefers, he may purchase the aircraft without any radio and install equipment to meet his particular needs.

The throttle pedestal follows the usual pattern of throttles, prop pitch and mixture controls. This writer suggests painting the mixture control knobs red as a good "safety of flight" item. Below these controls are the landing gear indicators. To guard against inadvertent retraction of gear on the ground is a mechanical latch positioned above the control lever. The control knob is in the shape of a wheel to differentiate it from the flap control knob which has an airfoil shape.

The hydraulic actuated gear retraction requires 11 seconds: gear lowering, 12 seconds. A manually operated hydraulic pump is located between the flap and gear controls on the center pedestal and is used in event of failure of the engine-driven hydraulic pump on the left engine. Twenty to thirty seconds are required to pump the gear down by hand. A change in future production calls for installation of a CO^2 cartridge in the cockpit with lines to each landing gear. With this feature the gear may be blown down in emergency.

Individual carburetor heat controls are located above the emergency hydro pump.

Air conditioning controls are located at the bottom of the pedestal. An 18,000 BTU Southwind heater in the nose furnishes an automatically controlled source of hot air for the cabin and for defrosting the windshield. The author considers the heating and ventilating system to be very adequate.

The fuel system is fool-proof. Fuel is stored in two 36-gallon rubber cells located outboard of the engines. Fuel can be pumped from either tank to both engines and any one of four fuel pumps can supply fuel to both engines. During normal operation, the engine driven pumps supply fuel directly from the tank to the adjacent carburetors. Electric auxiliary fuel pumps are installed in by-pass fuel lines between the tanks and the engine driven pumps. The electric pumps can be used to provide pressure in the event of failure of the regular pumps. They should be used during take-offs and landings to preclude the possibility of fuel pressure loss due to pump failure.

The elevator and rudder trim tab controls and indicators are located on the ceiling, above and slightly to the right of the pilot. The elevator trim control consists of a large crank, while the rudder trim is a smaller crank located inside the elevator trim control.

After starting the engines, we taxied out for take-off. The nose wheel is steerable through a 30 degree arc by use of rudder pedals. The ground handling and riding characteristics of the plane are good. With this nose wheel steering, the novice multi-engine pilot will have no trouble to master taxiing. The use of engines in taxiing is obvious: for the left turn, the right engine is used to start the turn and before the airplane has reached the desired heading the right engine is throttled back and the left engine is used to stop the turn. The opposite is true of the right turn. In some conventional multi-engine aircraft a beginner needs considerable practice to master taxiing. However, in the case of the *Apache* with the tricycle gear and nose wheel steering, taxiing is very simple. I did not have the opportunity to taxi the ship in a strong crosswind, but seriously doubt any problem would exist.

Using the easy-to-follow check-off list, the engine run-up was completed. Feathering checks on the ground are not recommended, because of the excessive vibration caused in the power plant installation.

The *Apache* accelerated fast during the take-off roll. I estimated our take-off run as slightly under 900 feet. Climb-out was made at 125 mph which would be a good safe single-engine speed. In the *Apache*, we have the added safety factor of an extra engine. However, this will remain a safety factor only so long as single-engine requirements are met. To maintain flight on one engine it is necessary to have single engine speed. In the case of the *Apache*, the best climb airspeed is approximately 95 mph: 85 would be minimum. For this reason, do not pull the aircraft off the ground. The gear should be retracted as soon as you are safely airborne. Before assuming a definite climb, single engine speed should be reached. Incidentally this is no problem with this ship. It accelerates very fast and the novice should have no trouble with take-offs.

The *Apache* is so easy to fly, that Piper officials, when demonstrating the airplane, (*Continued on page* 65)

The Methodist Church provides an air ambulance for the far-flung islands of the Caribbean

"All God's Chillun Got Wings"

By EDWIN M. BARTON
Chaplain, USN

MOST OF CULEBRA ISLAND crowded around the blue Stinson as a tiny girl was gently lifted into the plane. She had less than 25 hours to live unless taken for emergency surgery to a San Juan hospital 70 miles over the choppy Caribbean. By boat it was impossible.

The airplane from nearby Vieques Island had her in Puerto Rico within the hour. Three hours later, she was minus 14 inches of diseased intestine. Two weeks later, the Stinson flew her back to Culebra—safely on the road to recovery.

This was one of over 1,200 ambulance flights the Methodist Missionary, Rev. John K. Vincent, has made from the islands of Vieques, Culebra, and St. Croix, to Puerto Rico. But now the Stinson has been replaced with a new Cessna 170-B—modified for stretcher patients and capable of operation from short, improvised runways. The Reverend Vincent has made inter-island ambulance flights a vital part of his ministry for over seven years; almost the time he has been Director of the Viques Island Mission.

Arriving at Vieques, an island of the Lesser Antilles, east of Puerto Rico, the missionary found himself considerably more isolated from San Juan than the intervening 70 miles of sea would indicate. There was only one passage per day by scheduled mail boat. No islander owned or could pilot a plane. Vieques offered a hospital bed to no one. The boat-car journey to San Juan normally takes 14 hours, regardless of urgency.

When Vincent undertook his work in the Caribbean, there were no funds in the Mission budget for an airplane. He immediately saw, however, that a plane was his most needed item. But money was not all he needed. He could not fly. He began flight instruction at West Indies Flying Service every time he was in San Juan. He soloed within weeks. With his student "ticket," he could fly between San Juan and Vieques in less than an hour—except for one small fact. He did not have an airplane. He wrote the Methodist Mission Board in Philadelphia about his plight. Their answer was a fatherly document on the dangers of flying, indicating that the matter was tabled. But it did not forbid the 26-year-old preacher to proceed on his own initiative.

This initiative prompted him to use his entire annual travel allowance to buy a half interest in a plane, a used Piper *Cub*. An adventurous physician, Dr. Agenor Carle, who had the Puerto Rican Public Health Service responsibility for Vieques and Culebra, joined with Vincent in co-ownership.

The first year only a few patients were flown to San Juan in the back seat of the *Cub*. But Vincent piled up valuable hours of flying time and taught his wife, Ruth. His next year's travel allowance went to buy his flying partner's interest in the *Cub*. Vincent now made weekly stops at Culebra and regularly flew patients to the mainland. But he could still chance only adults healthful enough to ride the rear seat unattended; or children on Dr. Carle's lap. The very sick could not be moved.

Opportunity to better his transportation presented itself when Vincent obtained the Luscombe agency for Puerto Rico and thus gained access to a two-place *Silvaire* demonstrator. This had one advantage over the old *Cub*, in addition to greater speed. It had side-by-side seating arrangement. Now, very sick patients could be strapped in beside him, and tended en route to San Juan. In a year of combining sales demonstrations with ambulance flights, the missionary managed to sell three Luscombes. Pooling his sales commissions and the *Cub*, he traded for the Luscombe demonstrator, making him its bonafide owner. But his mission responsibilities had grown, leaving no time to run down buyer prospects. He had to forsake the needed commissions and concentrate on his primary duties.

Yet people whose lives could be (*Continued on page* 46)

Rev. Vincent (left) watches as injured Vieques Island woman is lifted into Methodist Mission Air Ambulance for flight to hospital in San Juan. Curved stretcher allows room for pilot and two passengers.

Five years after solo,

with instrument and instructor ratings, this

experienced pilot takes

A BACKWARD GLANCE

By JANE D. WHITE

I REMEMBER TURNING to my instructor one day just before I soloed and asking him, "How many hours have you?" He looked at me with a twinkle in his eye and replied, "Fifteen hundred, Janie."

To me, with a grand total then of six or seven exhausting hours, 1,500 seemed as remote as a million. I wondered if I would ever accumulate 1,500 hours as a pilot, and if I did, how would I feel? What would I have learned? Would I know everything there is to know about flying?

Five years later, my log book shows a total of 1,690 hours accumulated on a variety of planes. My husband and I have owned two: a *Seabee*, in which I had my first real dead-stick landing, and currently a *Bonanza* which I fly on instruments when necessary and on simulated instruments as often as I get the chance.

And now, with over 1,500 pilot hours behind me, I feel as if I were just beginning to find out what flying is all about. I have discovered, however, three hard and fast rules which seem to hold up under every circumstance. Conceived through experience, they constitute my "Bible" of flying.

First: *I've learned to always give myself an out.* If I know the weather ahead is not very good, I make sure there is time and gas enough to get back to the good weather I've just left, or that there is an alternate which will remain open. Many a time I've executed the well-known 180 degree turn—I've long since gotten over any embarrassment in doing so. And I'm not averse to making an unscheduled landing for gas if the inevitable headwind increases in velocity, rather than stretch those last few gallons.

The author at the controls of her *Bonanza*.

In flying single-engine IFR, I prefer to have at least an 800 foot ceiling beneath me, just in case that million-to-one chance called "complete engine failure" happens.

My second hard and fast rule is: *Thinking Ahead.* Thinking ahead is tied in with never letting yourself get in a position from which there is no out. Anticipating emergencies is the one sure way of keeping the "panic button" from ever being pushed.

When I was first soloing, every time before take-off I'd mentally go over what to do in case the engine quit on take-off. Even now, after not flying for a month or so, or if flying an unfamiliar aircraft, I do the same thing. If I'm IFR, repeating to myself now and then what to do if the oil pressure drops or the engine runs rough or I lose my radios, is a big help. Knowing something positive to do when, if and as anything goes wrong gives a sense of order and keeps you calm. Whenever I'm prepared, nothing happens. But the minute I get sloppy, I regret it every time.

The third rule I learned the hard way: *It doesn't pay to hurry.* I'd been weathered in at Macon, Ga., en route to Florida, and finally, one morning before dawn, the weather reports indicated the route was open. I jumped out of bed, threw on my clothes, called a taxi and raced to the airport, arriving with the dawn. Putting my two suitcases next to the flight office door, I went off to see about getting the plane out.

Finding no one (it being so early and a Sunday to boot), I went to work and pushed, pulled and strained, finally getting the heavy hangar doors open, only to find the *Bonanza*, of course, buried in the back. After a minute's rest, I started emptying the hangar, growling to myself about the line boy not being there—he *knew* I was going out the minute the weather improved.

By the time the hangar was cleared, I was in a raging huff, and it didn't help much just as I got my plane in the open to see the two line boys and the manager drive up. When they offered to check the oil, I snarled a haughty refusal, thinking I could do it faster. So I checked the oil, jumped into the *Bonanza*, slammed the door loudly, and started the engine. Racing, not taxiing to the runway, I gave 'er the gun.

Just as we broke ground, the oil compartment door on the front cowling popped open and flapped and banged metallically in the breezes. A little sheepishly, but still snarling, I made a close pattern, without even raising the gear, and landed, shutting off the engine. Leaping out, I ran to the front and shut the oil door securely, thinking, with a wry grin, that perhaps it wouldn't have happened if I'd let the line boy check the oil. Ten minutes gone!

Jumping back in, I got the engine started and took off. Under way at last! Half an hour (*Continued on page* 70)

By MAX CONRAD

After dreaming of a flight to South America for years, this veteran pilot jumped at the chance to take a Cub and go

BREEZIN' DOWN TO BOGOTA

I WAS AT PIPER FIELD, Lock Haven, Pa. when Bill Sparks, owner of Ferry Service Inc. said, "Max, I have twenty PA 18's for Bogota, Columbia. Like to ferry one down for me?"

For years I have dreamed of a flight to South America. In five minutes I was signed up.

The aircraft, HK 1119, and its papers (export license, permission to fly over and land in various Central American countries) were in order. For myself I would have to have a United States passport, visas, a certificate of health and shots in the arm—smallpox, yellow fever, and so forth. Within 48 hours, I had the works.

Bill introduced me to Abraham Strong, a pilot who has made 20 or more flights to South America. Abe and I were to fly together. We hit it off fine. We installed special 35 gal. tanks which, with the normal capacity, would give us almost ten hours range. Our aircraft had no radio so the flight would be contact. At three o'clock that afternoon, Bill handed us checks and a typed slip of instructions which amounted to only this:

1. Do not land in Guatemala. (Confiscation of the plane and imprisonment is entirely possible.)
2. Do not land in Nicaragua unless a genuine emergency.
3. Do not fly at night.
4. Drain auxiliary gascolator and main gascolator prior to each takeoff, regardless of whether you have refueled or not.
5. On arriving at Bogota, land only at Techo Field as that is the only place where you can contact customs. Not having a radio, they will probably give you a red light, but just keep on circling until they do give you the green light.

We were to take off the next morning at eight o'clock.

When I arrived at the airport in the morning, Abe was already checking weather. We decided to aim for Memphis, 900 miles southwest. Taking off and flying side by side, compass course about 240°, altitude 4,000 feet, in the warm smooth air was the perfect beginning. At 2,350 rpm, the PA 18's indicate a strong 100. As the morning wore on, the air became hot and gusty, and by noon it was obvious we were heading into thunderstorm areas.

About 1:30, the western sky clouded up with a mild line squall. We were running into a strong head wind of 35 to 40 miles. I always like to fly close and parallel to line squalls and thunderstorms—the closer the better. In this way, irregularities and breaks in the storm show up. Invariably I find openings and clear spots that take me safely to the other side of storms. Once on the other side, one always finds a reversal of the wind. That is just what I wanted—a tailwind. But Abe didn't relish my idea because, as I turned west into 30 or 40 miles of medium rain, he continued straight south and, before I had time to make a 180, we were separated.

Knowing that we would meet in Memphis, I continued on now with a cool, brisk northeast wind and showers most of the way, arriving at Memphis about five in the afternoon. After gassing for flight in the morning, I located the Rebel Motel, three and a half miles from the airport, leaving a message for Abe to find me.

At 3:30 next morning, the sky was dark and overcast. "Brownsville is almost 900 miles southwest," I thought, as my sleepy mind tried to decide whether to crawl back into bed or get an early start. Prospects of a strong tailwind did it. "Abe will be in Brownsville tonight too, and we'll fly southward together," I thought. At 4:00 I left the motel. It was colder than I expected—probably in the low forties. Down the highway I started walking, brief case in hand.

Three rain squalls caught me: three times I gained shelter by running for it—once in a barn, once in an

unlocked automobile, and once under some trees. In two hours, I arrived at the airport, cold, wet, and my clothes certainly unpressed. It was daylight. I untied HK 1119 and drained the gas sumps. Between squalls, the weather was good enough for contact flying so I planned to take off immediately. While warming the engine, I turned on the cabin heater and it took the chill out of me, dried my shoes and raised my spirits I was glad I had risen early.

Sitting there ready to take off, I noticed another squall approaching, so got in the air, made a quick 180° to the south and, in ten seconds, was out of its reach. The sky was forbidding but to the west were signs of clearing. Westward I flew, visibility and ceiling improving each mile. As I crossed the Mississippi, I looked back at Memphis. Wind and rain were drenching the city.

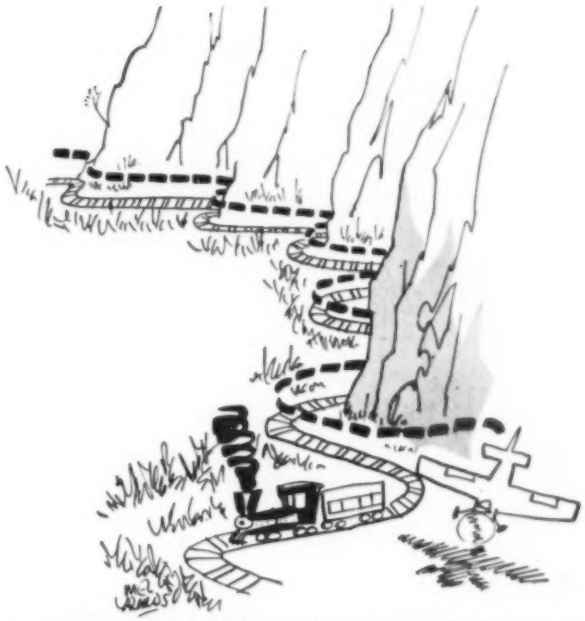
But the gods were kind to me. I don't know when I have had a better tailwind . . . blowing me right to Brownsville. The weather cleared. I flew higher and higher. By 11:30 I was on the ground at Brownsville and my only problem now was to keep HK 1119 from blowing away. With the help of three or four men from Border Aircraft Service, we got my *Cub* safely hangared.

My first thought was to wait until Abe came and, in the meantime, clear customs into Mexico. With the aid of a broker and an $8 fee, I was escorted through United States and Mexican officials in about an hour. Not, however, without buying a Mexican tourist card for $3.01. After I gassed and had lunch, I remembered that wonderful tailwind, so left a note for Abe that I would follow the east coast of Mexico south to Tampico. Flying at 9,000 feet I made those 290 miles to Tampico in less than two hours and decided to use my tailwind on to Tuxpan, Nautla, or perhaps even to make the 500 miles to Veracruz that night.

". . . paying, of course, 15 pesos to bring the immigration officer out."

On passing Tuxpan, the desert below suddenly becomes fertile land with tropical foliage, crops and orchards. Numerous cottages dot the beach and good-looking hotels loom up, a few of them with landing strips. Approaching Nautla, I figured plenty of time to get to Veracruz, so continued right on. The land remains fertile, even becoming jungle-like. Thirty miles south of Nautla, the mountains reach almost to the seashore. About here the air became very hazy due to numerous forest fires that dotted the northern slopes. Without a radio, I became concerned about getting caught at Veracruz at night in poor visibility but, 25 miles north of town, the air was perfectly clear again and I could see the city. Instead of dying down, my north wind was whipping it up for sure. As far as I could see out in the gulf were white caps and lines of foam. Losing altitude over Veracruz was a pretty sight, the sun setting over the mountains to the west, the city with its red-tiled roofs, ancient parks and churches, the angry waves splashing over the sea walls.

". . . loose parts—maps cans of oil and coke bottles bounced around."



"At German Oland, I picked up the railroad that winds . . ."

There was no time to linger and I dove to the airport to be on the ground before dark. Only then I really became aware how strong was the wind. I do not recall when I had to pull a safety belt so tight: loose parts—maps, cans of oil, and empty coke bottles—bounced around but none of them went through the windshield or ceiling. It wasn't hard to land but next to impossible to taxi off the runway, so I just sat there, tail high and holding the brakes. Workmen ran out to my aid and, with their help, I was able to get to a parking space and tie down.

Veracruz is a busy and interesting city and also a very cheap place to live; the peso has been devalued, 12½ pesos per dollar, but prices have not been changed to match it. I had a fine room with a shower for 15 pesos, as good a steak as I've ever had in my life for 10 pesos and a really comfortable pair of shoes, soft, high-grade leather for only $2.90 in American money. Even the ten-mile ride into town in the taxi was only ten pesos. No word from Abe.

It had been a long day so I didn't see any of the night life. I was in bed before ten and up again by five next morning. The wind had died down. I gassed up. With all the air traffic down here, it is hard to understand why they persist in handling gasoline in barrels. They just roll a barrel to your plane, unscrew the plug and splash an approximate amount of gas into a dilapidated pail or old dope can. They are careful to strain it into your tank through a chamois skin. I still don't know how they measure. We use gallons. They use liters. I think of a gallon as being about three and a half liters and, according to the amount of flying I did the day before, I calculated we put in about 85 liters. When the attendant, who talked a little broken English, told me he put in 115 liters, I had the feeling I was being taken. But when he told me these 115 liters, cost me only $5.70, I felt ashamed of myself. At home that gas would have cost me $11.

Clearing Veracruz and filing a VFR flight plan to Tapachula was simple. By 7:05 (*Continued on page 44*)

日本航空界

Japan's aviation industry is flourishing in line with American policy to bolster her military establishment and enlarge her National Safety Force.

By ED HYMOFF

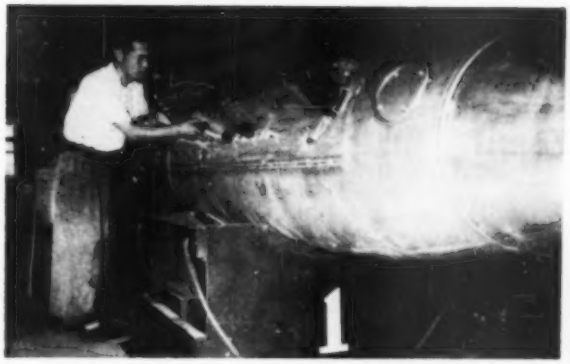
THE REBIRTH OF

1. An employee of FEAF, Mr. Sakamoto works on USAF fuel tank.

2. Checking pressure on a fuel tank.

3. Akiwa Kunitohi, Kisuno Yoshio and Yoshino Yousuke install a canopy in the Plastic Shop of the 6400th Air Base Wing Depot.

4. Japanese and American personnel pull cocooning material from an F-86 *Sabrejet* at Kisarazu Air Base, Japan.



2

JAPANESE AVIATION

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JAPAN'S ONCE BURGEONING aircraft industry . . . the power behind the bombers which almost obliterated the U.S. Fleet at Pearl Harbor, and which subsequently itself was crushed to rubble . . . is rising slowly but surely from the ashes of defeat.

Until the peace was signed in San Francisco, April, 1952, all national aviation activity had been banned in post-war Nippon. But Japan had been anticipating the day of Treaty. Following the war, she had rehabilitated her great aircraft factories as far as possible and turned their facilities to peaceful pursuits . . . manufacture of automobiles, motors, tools and kindred equipment. Such names as Nakajima, Kawasaki and Mitsubishi helped set Japan, the greatest industrial power of Asia, on her way back to national stature.

First major aviation project to be undertaken in post-war years by Japan's industry was a result of the Korean War. United Nations Air Forces needed great quantities of wing-tip tanks and napalm containers. Such items are bulky and constituted a drain on long-range transportation. The factories which turned out the *Zeros* were put to providing them on the spot.

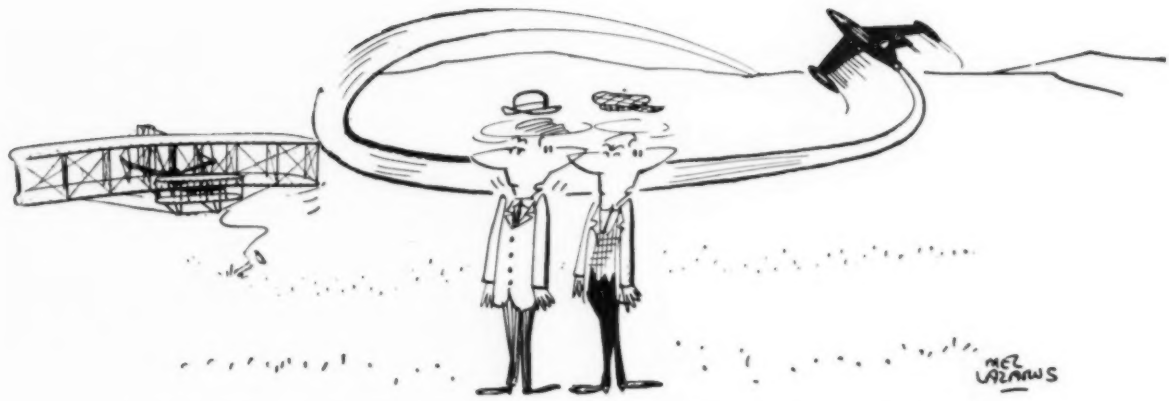
By the end of 1952, Japanese aircraft plants were repairing combat damage and war weariness of B-26's, L-19's, C-46's and C-47's and F-80's. Some of the B-26's overhauled by Japanese were later sent to French forces in Indo China.

Col. Robert J. Murphy, Jr., Director of Procurement and Industrial Planning for FEAF and thus one of those most responsible for rebirth of Nippon's aircraft industry, reports that "her aircraft plants saved us extensive time and money; turned out excellent fuel tanks and napalm containers and did good repair work on military aircraft."

While the Fuji Heavy Industries Plant, the former Nakajima Aircraft Factory, produced many thousands of fuel tanks, the Itaml plant of the Shin Meiwa Industries near Osaka, and the Kawasaki Aircraft Company, each month overhauled several dozen combat airframes.

The cost for man hours of work in Japan, explained Murphy, came to about 65 cents an hour. "In the States," he pointed out, "costs for the same work come to about $5 per man hour."

Murphy judged the Japanese weren't ready to handle jet engines in their plants during the Korean fighting. "But they are learning, and learning fast," he emphasized. "Japanese engineers and (*Continued on page* 42)



JUST IMAGINE!

Forecasting the next fifty years of flight. Bill Lear envisions the Anti-gravitational Age.

By WILLIAM P. LEAR

Chairman of the Board of Lear, Incorporated

The author

WHAT WOULD HAVE been said if, at the time of the Wright Brothers' first flight, someone had asked, "What will an airplane look like 50 years from now?" Could even the most brilliant and daring mind of that time imagine today's automatic flight controls, supersonic speeds, and fixed-wing vertical takeoff? And who among us can look down his nose at prophecies for the next 50 years? So hold your hats. Here I go!

In far less than 50 years, all flight will be made automatically, as far as stabilization of the aircraft, directional control, and flight program are concerned. Take-off will be done scientifically and exactly, maintaining a heading and the exact attitude to give maximum safety and performance with the horsepower available.

When the pre-selected altitude is reached, the ship will automatically level off and thereafter hold that altitude to precise limits for the entire portion of the flight to be flown at that particular level.

These devices will greatly improve the comfort of passengers as well as increase the safety of the ship by insuring against structural failure. Automatic controls will guide the ship unerringly to its destination, and then completely control and program its landing procedure right down to the deck.

This may sound like 100 per cent "push-button" flying and suggest the possibility of eliminating the pilot, co-pilot, and flight engineer. Nothing could be further from the actualities to come! These people will all be needed, but they will function rather as managers, observers, monitors, and planners of the flight. They will be required on board to make substitutions of other equipment or apply manual controls in the event of automatic failure. They will do their job far better than they do it today, for they will be relieved of continuous, repetitious, boring, and tiring details of correcting the aircraft for every minor deviation. This kind of thing an automatic device can do so much better than a man that it is ridiculous and archaic to see men still doing it as of today. It is beginning to be an accepted fact, and is definitely a provable fact, that no man can fly an aircraft in turbulent

". . . sell your stock in them and buy 'Solar Energy, Incorporated'."

air as accurately, safely, and comfortably, as a properly designed automatic flight control system.

CAN BE DONE NOW

The above isn't much of a prophecy, because this sort of thing can be done today. It doesn't take much imagination. It can be put into effect on any airline within one year, with equipment now available. But when we think of instrumentation for the next 50 years, we must try to imagine what the future aircraft will look like. This we must know before we can foresee what the controls for such an aircraft must be.

But rather than discuss at length the instrumentation and automatic controls for types of aircraft operating on aerodynamic principles, I prefer to launch out into the real future of aviation. In the future aircraft will not depend upon air as a means of lift.

". . . finding yourself an overstuffed lounge chair . . ."

This statement will, undoubtedly, shock the socks off any orthodox aeronautical engineer or aerodynamicist, whose basic theory is built on the flow of a liquid (namely air) over a surface to provide lift. Yet the only reason they need "lift" is because of gravity. One of these days some smart scientist will come along and move us into the anti-gravitational age. Just as scientists moved us into the atomic age, and then into the hydrogen age, someone will surely find out a way to create a gravitational field whose polarity can be controlled to cancel gravity. As soon as this is done, all aerodynamicists can "fold up shop." Airflow will be of practically no benefit whatsoever since "lift" is not needed.

". . . 100 per cent 'push button' flying . . ."

SCREAMS EXPECTED

I can hear the aerodynamicists screaming right now: "What about skin friction?" I can see the aeronautical engineers trying to keep a foothold by saying: "What about structural integrity?" And the physicists worrying about acceleration and its effect upon the human body. But one of the beautiful things about anti-gravitational devices is that, as soon as one can establish an electro-gravitational field, all of the mass, materials, and personnel within that field will undoubtedly be part of it and unaffected by the gravity of the earth or the gravity of any other planet. Which means that if you were riding in an anti-gravitational car, no matter how fast you accelerated, your body wouldn't any more feel it than you feel the speed of the earth today which moves at a speed of 1,000 miles an hour around its axis at the equator and 66,000 miles an hour through space. If everything moves together, and everything is affected by that same field, there is no relative force within that field.

". . . you may become a derelict in space."

HOW?

You might say, "Well, how can this be done?" And you might as well have asked the Wright brothers how they could make a jet aircraft fly 2½ times the speed of sound. The answer will come with the gradual accumulation of knowledge on the subject of atomic energy, which I believe will open the way for some means of controlling an electro-gravitational field, which can be so adjusted as to increase or decrease the weight of any object in its immediate surroundings.

There is no doubt that the ultimate atomic effort will result in direct conversion of atomic to electrical energy. At present, to make electrical from atomic energy, it is necessary to go through the heat cycle, using the atomic energy to make steam, the steam to run an engine, the engine to run a dynamo, and the dynamo to produce the electricity. One of these days some wizard will find out how to convert atomic energy directly to electrical energy. When this is accomplished, the efficiency will be 100 times greater than the present heat-cycle method.

IT'S PLAUSIBLE

With progress in understanding the makeup of the gravitational field, it is within our imagination to accept the plausibility of controlling it. Once we have control of the gravitational field, or know how to control it, we are no longer dependent upon airfoils for lift, nor are we greatly concerned with the weight we have to lift.

Imagine going to an airport, which will consist of any open space above a building; getting into a car which may be shaped like a flying saucer, finding yourself an overstuffed lounge chair, and at departure, looking out the window to see the city disappearing under your feet. Within a relatively short time, you are decelerating to a feather-touch approach on the same kind of platform at your destination. You will not experience any aerodynamic shocks due to gusts nor will you have any fear of wings falling off, for you will have no wings. It is quite possible that part of the flight will be made at 10, 20 or 30 miles up, and you won't worry about pressurization for you will carry oxygen with you just as a submarine does. The only fear you will have will be that, if the control mechanism goes bad, you may become a derelict in space, and end up floating somewhere between the earth and the Milky Way. But the least of your worries will be falling.

NEW ENERGY

The type of controls required will be those which will very carefully balance and accurately meter the anti-gravitational force to control the lift and direction of your space-car. There is no doubt in my mind that if we don't destroy ourselves in a hydrogen or cobalt age, that the above prophecy will come true. And if the airplane companies don't keep their eyes peeled on such a possibility, I recommend you sell your stock in them and buy "Solar Energy, Incorporated," which I predict to be the next largest source of energy in our lives to come. END

Flight Scholarships

The Michigan Wing of Civil Air Patrol, by providing flight training for its young people, is performing an outstanding service to U. S. Airpower.

By LOUIS A. EDWARDS
Michigan Wing Commander, CAP

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Lt. Col. Alice Hammond, CAP, Michigan Wing Coordinator for Women, and Michigan Wing Girl Cadets who received flight scholarships in 1953.

2

CAP Cadet Corine Ecker of Flint, Mich., studies an aeronautical chart with her flight instructor, Bernice Trimble.

3

CAP Cadet Kenneth Bearup, Flint, Mich., runs careful pre-flight inspection under watchful eye of instructor Urban Gowen.

4

Smiles and starry eyes reflect the enthusiasm with which 66 male Cadets of the Michigan Wing CAP received flight scholarship awards last November. They have all soloed by now and are building up time towards private pilots' licenses.

IN THE AUTUMN OF 1950, a group of Detroit women won a newspaper contest on suggestions for neighborhood improvements. But the prize check lay uncashed. They couldn't find any "best" way to spend it.

Finally came inspiration. . . . Use the money to buy dual flight instruction for some deserving CAP Cadet.

Danny Brown, of a Detroit squadron of Civil Air Patrol, was selected and the award made with appropriate ceremony. Thus was sparked a plan which has been expanded in Michigan to a point where it bids fair to set a national pattern for CAP flight training.

Local publicity accorded the first award spurred us to promote more scholarships. In 1951, the Michigan Council of Exchange Clubs adopted our Scholarship plan as a project for all Michigan units. Twenty-one scholarships were furnished by Exchange Clubs that year. Biggest booster was the New Center Exchange Club of Detroit.

Originally the club underwrote three scholarships and, to select the lucky cadets, had invited six eligibles to a luncheon. The inevitable happened. Club President, George Cushing, moderator of Radio Station WJR's "In Our Opinion" program, maneuvered a new vote. All six cadets were given scholarships.

Aided by funds from individuals and a sizeable "donation" from the Aero Club of Michigan, we were able to award 50 flight scholarships to cadets in 1951.

Early in 1952, a series of startling articles began to appear in the press. The spark plug article was FLYING's editorial of March '52. General Carl Spaatz called it, ". . . perhaps the most thought-provoking commentary on aviation in the post-war period," in an article which he authored on, "A Lost Air Policy" (FLYING, May '52). FLYING again sounded the tocsin in an editorial, "The Will To Survive" (July, '52).

In September of '52, *LOOK* Magazine's article "Are Young Americans Afraid to Fly?" spread the sad facts to the non-flying public throughout the land. Americans awoke to the realization that everything was definitely NOT rosy.

Indeed, a challenge was staring us right in our rather blank faces—perhaps one of the greatest challenges we, as a nation of volunteers, would ever be asked to meet.

In May, 1952, the National Aviation Trades Association presented some pertinent facts to the Interstate and Foreign Commerce Committee of the House of Representatives . . . facts established in a historical study of 27,210 student pilots of WWII. NATA pointed out that 49 per cent of those air cadets who had never flown previously were eliminated in military training. Only nine per cent of those who previously had soloed failed to complete the army program. Only five per cent of those who already held a private pilot's license were eliminated. And only four per cent of those who had a commercial pilot's license were washed out of the military.

Data from numerous other sources, including CAA, provided additional evidence and ideas for long range solution to the problem, *but no short range solution.* Meantime, the Air Reservist and others reported that Russia's youth was getting flight training in its regular school systems, and in an expansive national youth program.

Summing up our accumulated facts and adding to them our personal observations, we came to inescapable conclusions.

The United States is not bringing on a new crop of airmen. Our enemies are.

A reserve of young civil airmen saves the nation both time and money in days of crisis.

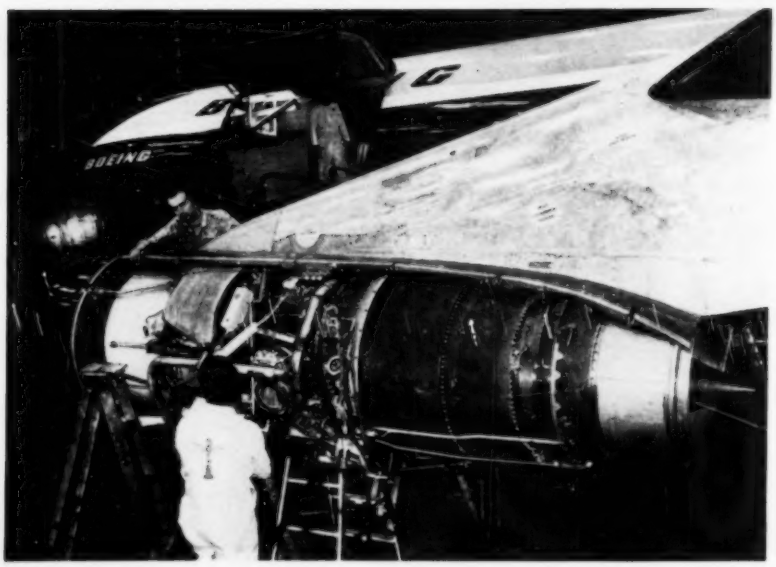
The prime obstacle to flying at a youthful age is economic in nature.

The CAP Cadet Corps is the (*Continued on page* 60)

NAVY TRAINER Left: Unique performance photo of Navy's new primary trainer, the Beechcraft T-34 *Mentor*, taken with a K-20 camera using a light yellow filter and Aerographic XX film shot at 1/225th of a second at f.8. Powered by a 225 hp Continental, the two-place tandem trainer has no aerobatic restrictions.

Have You Seen?

RECORD BREAKER Right: Four world long-distance records were shattered by two Italian women pilots in this Piaggio P. 136-L amphibian, powered by two 240 hp Lycoming engines with constant-speed, three-bladed propellers.



POWER Left: Servicing one of four Pratt & Whitney JT3-L turbojet engines installed in Boeing's 707 prototype jet tanker-transport. Each engine, mounted in a streamlined "pod," develops more than 10,000 pounds of thrust. These engines give the aircraft a cruising speed of 550 mph and an altitude range of 40,000 feet.

THREE-BLADED PROP

Right: Smoother, quieter operation of the new, "swept tail," Aero *Commander* is achieved by the use of Hartzell's three-bladed hydro-selective, constant-speed, full-feathering propellers designed especially for light twin transports. The new three-bladed props are six inches shorter than the two-bladed model originally designed for the *Commander*. Feathering is accomplished by use of a spring mechanism and unfeathering is accomplished by use of engine oil pressure.

STEAM CATAPULT

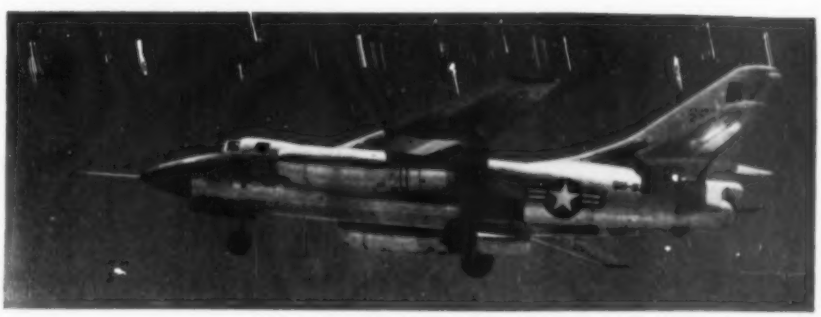
Below: McDonell F2H-3 *Banshee* takes off from carrier with the aid of catapult operated by steam from ship's boilers, without the use of rams or hydraulics. This British development has been adapted by the U. S. Navy and will be installed on all its carriers to enable launching heavier and faster aircraft than can be handled on hydraulic catapults.

PRODUCTION COURIER

Above: The fully-certificated, four-place, all-metal Helio *Courier* is now in production. The plane which embodies many safety features and can take off, fully loaded, in 220 ft. and clear a 50 ft. obstacle in 500 ft., is powered by a geared Lycoming 260 hp engine. At 72 per cent power, the *Courier* cruises at 157 mph at 8,500 ft., burning 15 gph. An interesting feature of this plane is the use of fibrous-glass laminated plastics in wingtips, tips of the "slab" one-piece tail, fin tail fairing and for the entire door frame. Flyaway factory price of $24,500 includes as standard equipment full primary blind flying panel, 15-G seats, shoulder harness and safety belts, navigation lights, Hartzell 101-in.-diameter constant-speed prop, ejector-type engine muffler, hydraulic brakes, cabin heater, cylinder temperature gage and other items. The Goodyear crosswind landing gear shown in photo is optional.

FIRST FLIGHT

Right: Swift and versatile new reconnaissance bomber developed for the Tactical Air Command by Douglas, the swept-wing, twin-jet RB66-A recently completed its first test hop successfully.



Look, Ma, No Hands

Strange things sometimes happen when two instructors fly together!

By BOB FORBES, Captain, AFRes

As told to ARLENE D. FORBES

CARELESSNESS is a sneaker. When it comes up on your blind side—so to speak—that's when it can be pretty final. I know. Carelessness nearly put an end to my career, early in World War II—right on home soil, at that. I have had some close calls since, but none I could lay to negligence.

At this time, I was instructing a Fixed Gunnery Course at Yuma, Ariz. It was one of Yuma's sizzling days and we were all hot and tired, ready to leave the auxiliary field, after the day's practice. The cadets were returning in a group to home base. Lt. Ted C———, another instructor and my close friend, and I piled into an AT6, he in the front, and headed home. We climbed to 12,000 feet to cool off a little on the way.

Ted and I had flown together in civilian life, took training at Mather Field together, so knew each other pretty well. Well enough to know funny business was not a part of the other's flying habits.

Since there was no hurry, we took turns doing aerobatics. Then came the MISTAKE. We ignored the mike, by mutual consent, and used the old method of shaking the stick to indicate a change of controls or to call the other's attention. The last, a method we would have trusted with few others.

I had been doing some hot rolls, then muffed a Clark-roll and "fell" out. As I straightened up, Ted shook the stick and turned the plane over home field—at the same time pointing to the sunset and cloud formation behind us. (It was beautiful as only an Arizona sunset can be.) Since Ted had interrupted my turn, I let him finish the flight. I even pulled out my stick and racked it beside me so I could turn my seat around and watch the view in comfort.

The author, when he was a Fixed Gunnery Course instructor

It didn't take me long to change my mind and position. The tail upped, cutting off my view. It seemed Ted was going to spiral-dive into traffic altitude, preparing to land.

The throttle was wide open; we were picking up real speed. I had checked the panel from habit. Habit, too, made me slide the throttle back a ways. Ted would do as much for me, I knew. At once Ted whirled and grinned at me. I didn't get what he meant, so I took it for a dare as he continued to dive. Daring was strictly not his way, but I wasn't worried about anything he wanted to try. I grinned back to show I was game—one eye on the airspeed.

Time was suddenly idle; every second an hour while the wind screeched up the sides of the ship and the ground magnified and flattened like a movie close-up. I hadn't had time to be uneasy. One instant things were usual, the next I was just plain scared.

Ted eased the throttle and whipped me another look over his shoulder. The force of our dive mashed my grin to my face. He was ready to pull out, I reasoned, and got set. He didn't! I couldn't stand any more—I got busy trimming tab for nose-up. If we made it now, every little bit would count. Still Ted didn't haul back on that stick. Despair sickened me. Then the tab turned under my fingers! We were both trimming. Neither of us flying!

While I scrambled to get my stick back in, Ted took over—less than a thousand feet above rock and cactus. He hauled back with all the power a big man has. The force of pulling out sucked us down to the bottom of the ship—blacked out. I could still think, even if I couldn't move much. I was still trimming tab when my head began to clear up. I got my stick in by the time Ted leveled the ship. We circled into position, came down and taxied into line.

There was a sense of unreality about climbing out of the ship; things around us were too normal. Ted's face was tense; he looked at me, hard and silent. There was nothing for either of us to say. We walked once around the plane, examining it. A wrinkled fairing was the sum. Had the dive done it? We didn't know; didn't doubt.

Back at our BOQ we dug out cigarettes, sat smoking awhile before words finally came. Ted admitted he had only meant to direct my attention to the cloud formation. As easily as that, we had misunderstood each other. The last thing he had seen, Ted said, before he blacked out, was the top of a tall cactus swoop by. By that slim margin we were granted a second chance.

Since then, I take nothing for granted. It is easy to follow the first—the basic—law of flying: *caution*. This I say for myself; Ted, no doubt, can say the same; and we can thank our lucky stars we realized it in time. END

No. 176

I learned about flying from that!

An old bush pilot's trick proved invaluable when the weather closed in "way down east".

By ROGER C. WILLIAMS

Publisher and Vice-President, Guy Gannett Publishing Co.

I'VE BEEN FLYING, off and on, for 20 years. In another 10 or 15 years maybe, I'll be rated one of Maine's "bush pilots"; but I doubt very much that I'll ever catch up with my friend Percy Billings, who's been flying northern Maine for more than 30 years.

The other day, as a result of following some of Percy's good advice, I was able to get through a situation which might have busted up a nice, new DeHavilland *Beaver*. I sweated a little; but because I'd practiced one of the bush pilots' old tricks, I was able to find my way into an airport under conditions of low ceiling, poor visibility and icing . . . with the weather rapidly getting worse.

Years ago, when the Boston & Maine railroad was flying tri-motored Stinsons from Boston to Bangor, Percy had a chance to ride with one of their experienced pilots. It was a beautiful, clear day, but the pilot stayed right down on the deck, flew all the way under a thousand feet. Percy puzzled about it for a while, finally asked the pilot why he stayed so low.

"Always fly low in good weather," the pilot said, "and then you'll know what the country looks like when you get forced to low altitude by bad weather."

This was long before the days of radio facilities, and the idea appealed to Percy. He's been passing it on to younger pilots ever since.

The author, standing on a float of his plane when the *Beaver* was equipped for water flying.

Most of my flying is in the State of Maine, in both landplanes and seaplanes. Probably 80 per cent is over the same routes and I'm quite familiar with them. Because I date back to OX-5 engines and the constant threat of engine failure, I like to fly at from 3,000 to 5,000 feet. But during the last year, I've frequently practiced low level flying around each of the airports I use regularly. I've gone right down to 300 feet and figured out a way to make a low level, poor visibility approach to the field.

Augusta and Waterville are easy, being close to the Kennebec River. The Penobscot makes Bangor and Old Town easy to find. Portland is the home field, and I naturally know every road, railroad and patch of water near it. But the field that paid off the other day is at Beverly, Mass., where I'd also practiced this low-level approach, using the Newburyport Turnpike as my point of departure.

I flew to Boston in the morning. The weather people in both Portland and Boston had assured me that weather would stay VFR all afternoon, despite the probability of rain and possible snow in early evening.

At one-thirty, I fired up the *Beaver* in Boston and taxied out. It was just starting to rain, but the situation was still far above minimums and the weather people still promised I'd have no difficulty.

An Air Force B-29 was working practice approaches on the northeast leg of the range. A Northeast *Convair* was working out over Boston Harbor, both reporting VFR conditions. When I called for taxi clearance, the tower asked my destination and when I told them Portland, they gave me a pilot report of low scud at 600 feet at Salem. I figured the scud was the beginning of trouble, but also figured things would follow established patterns and that I'd have more than enough time for the 45 minute flight to Portland.

So I took off. I should have put the plane in a hangar. I took off to the southeast and climbed to 700 feet. Things began to look not so good. The tower cleared me to make a left turn, despite the fact that about half the runway still stretched out ahead of me. (The *Beaver's* climb is miraculously steep.) I made my turn and started north, heading a little more inland than normal to dodge the Salem scud. The tower told me to stay off the northeast leg of the range because someone was making a let-down. I should have turned back and landed at Boston!

But I slogged my way through increasing rain, passed over Revere airport (I should have landed at Revere!) and picked up the Newburyport Turnpike and started northward. I dropped down to 600 feet and then 500 and occasionally 400 to stay under the ceiling which had been 2,500 just a few minutes before.

I called Boston radio and asked for the 1:30 Portland weather. They reported 2,700 feet and 12 miles. I decided things would probably be pretty sour up the line but that I could follow the Turnpike to Newburyport, go up the beach to Portsmouth, and when I got beyond Portsmouth, I'd run out of the rain and the low stuff, and have the Maine Turnpike under me all the way to Portland.

I kept the low frequency radio tuned to Boston Radio, the VHF tuned to Boston Tower. The Tower asked for a position and they cautioned me again to stay well clear of the range leg. It began to rain harder; hard enough to chip paint off the struts and the leading edge of the wing. The Wasp indicated it wanted a constant supply of carburetor heat.

I came on up the Turnpike to the spot where you turn off to go to the Beverly Airport, and sure enough, there was a field, faintly visible, about three miles away. I should have landed at Beverly right then!

I kept flying north. Boston (*Continued on page* 58)

The Rebirth of Japanese Aviation

(Continued from page 33)

technicians are beginning to work metals and process titanium. Within two years these people will be able to mass produce their own jet engines.

"By autumn of this year, they will announce completion of their first jet engine of purely Japanese design and materials. Shortly they also will have advanced their own airframe designs. Where they go from there is anybody's guess."

Some of our diplomatic and military people now on the scene have had "misgivings" at the rapid rise of the Japanese aircraft industry. Air Force and Navy Officers, Pearl Harbor still in their minds, privately wonder "where the Japs go from here." But in line with American policy to bolster Nippon's military establishment and enlarge the National Safety Force, the growth of Civil and military aviation continues at a comparatively swift rate.

Starting from scratch—in the schools—students are learning design and are working on airframes and engine mockups. One of Japan's top designers, Dr. Taichi Ogawa, known to his students as the Japanese "Messerschmitt," expects "limited but overall aircraft production" in two years. Ogawa's colleague at Nihon University, Dr. Hidemasa Kimura, also an aeronautical engineer of note, said, "Japanese industry can eventually turn out planes for export cheaper than any other nation."

Meanwhile, Japanese technicians are working in Lockheed's California plant under a commercial agreement instigated by the State Department between the Kawasaki Aircraft Corporation and Lockheed for the manufacture in Japan of T-33 jet trainers and F-94C interceptors. The long-sought American contract was finally made possible for the Japanese in March through the efforts of dynamic Toshi Tetsuka, president of Kawasaki. But top officers at FEAF headquarters in Tokyo expect all jet production of American models in Japan first to be turned over to the U.S. Air Force before ultimate disposition is made by America's top military planners.

The contract also provides for manufacturing and overhaul of jet engines under license agreement by Allison Division of General Motors. Although the Kawasaki president asked a token force of jets for Japan's embryo air arm, his request was turned down by Far East Air Force commander, Gen. Otto P. Weyland. The FEAF commander recommended to the State Department that Japan first learn to maintain jets by overhauling USAF models before receiving "token" gifts.

Weyland, however, expects USAF instructors very shortly to begin teaching the Japanese how to fly jets. Of the thousands of pilots who flew during World War II there are only 500 presently rated by the Japanese CAA. The majority of these are presently serving with the defense force and fly only light planes. In Tokyo every hard-driving, wild-riding taxi driver is reputedly a former *kamikaze* pilot. Despite lack of planes, Japanese college students have formed Aviation Leagues and are learning to fly 30 DeHaviland *Tiger Moths* purchased from the British for $150 each. Additional are the Otori Clubs organized by former Japanese military pilots who have purchased 15 surplus RAF trainers.

There are about 350 licensed aircraft in Japan, of all types.

However, the aircraft industry has plans to expand production from a few American models this year to a total of 1,045 planes by 1959. The breakdown, according to present planning, calls for construction of 105 helicopters, 500 light planes, 160 medium types between 600 and 1,000 horsepower, 80 multi-engine transports, 170 training planes and 30 gliders. Although these plans are public, prominent Japanese industrialists are reluctant to discuss the same period. They shrug their shoulders and say "jet production depends upon the will of the nation to allot adequate funds to rearm itself."

C. J. Reese, president of Continental Motors Corp., right, after signing agreement under which Fuji Motors will manufacture E185 engines.

The first planes obtained by Japan after the war were single-engine Cessna's purchased by Tokyo newspapers by permission of occupation authorities. Each major newspaper, in the forefront for Japanese air supremacy in Asia, now owns at least two planes. Asahi Shimbun, Japan's most influential daily, owns four. Several papers have Bell helicopters. Others have twin-engine craft sporting the publisher's own flag alongside the national ball-of-fire insignia.

Commercial transport first took form in mid-1952 when the government controlled but privately owned *Nihon Kooku* (Japan Air Lines) opened a passenger route from Hokkaido in the north to southernmost Kiy ıshu, an insular airway stretching some 1,200 miles.

With three leased planes, JAL began operations and ran at a deficit until Japanese businessmen began to take pride in their nation's first post-war airline.

By early 1953, JAL was ranging Japan's five main islands covering a 1,747 mile route. In February '54, JAL launched its trans-Pacific route from Tokyo to San Francisco. Next year JAL hopes to place two *Comets* on the Tokyo-San Francisco run, cutting down the 6,700 mile run of 31 hours to 10 hours.

Since JAL started two years ago, the line has been conducting regular classes at Haneda Airfield, Tokyo International Airport, for pilots, navigators, radio men, engineers, pursers and stewardesses. Thirty American pilots and a similar number of Japanese pilots have been working and flying together. Very few of the Japanese pilots are war-time fliers; most are post-war pilots trained in the States and now learning their job under the tutelage of American airline captains.

The biggest boom for Japan's commercial aviation is the ability to carry a larger payload than American or European competitors. "Japanese and other oriental peoples weigh between 100 and 120 against an average 170 pounds for Americans and Europeans. If one of our 60-seat airliners is filled with Japanese or orientals weighing an average 110 pounds, the total passenger payload weight is 6,600 pounds," explained one JAL official. "The same airliner filled with Americans or Europeans averaging 170 pounds each would total 10,200 pounds. The weight difference is 3,600 pounds—worth real money.

Control of the airways over the past two years has been a serious problem to both Japanese and the U.S. Air Force which, under peace and defense treaties, controls the skies. Most Japanese pilots are unable to speak or understand English. Very few ground personnel are familiar with any type of air traffic control procedures. This lack of traffic knowhow is a constant headache to America's Japan Air Defense Force. Few Japanese light plane pilots are familiar with instrument flying. Most of them prefer flying VFR and more often than not, previously filed flight plans are changed in mid-air to the consternation of JADF pilots who have to "scramble" at the first warning of "unidentified aircraft" crashing the radar network. Unless pilot training in Japan catches up with the strides of aircraft manufacturers, and the Nipponese CAA improves in air traffic and administration, the high safety record presently based only on luck, will collapse.

Another problem facing the Japanese is lack of adequate airports. They are few and far between for the needs of small aircraft. The seven major terminals used by JAL, for example, are also used by American military aircraft. The few other available airfields of a size to handle four-engine bombers or larger are utilized solely by JADF and the FEAF Bomber Command. Nevertheless despite any and all lack, it is not hard to envisage the day when the planes of Japan may be flying throughout Asia. Japan has boundless energy and an abiding faith in its air destiny. END

AS WE GO TO PRESS

North American Aviation, Inc., and Shin Mitsubishi Reorganized, Ltd., of Tokyo have signed an agreement giving the Japanese company limited rights to repair and manufacture parts for USAF F-86's.

FLYING FARMERS

By BILL RENSHAW

BALING WIRE REPAIRS

"Baling wire," known a generation ago as the farmer's best friend, enjoys new prominence when an FF uses it on his airplane.

Best story is of two Illinois FF's who made a forced landing in a Georgia cabbage patch. Discovering a busted fuel line, they searched out a piece of baling wire and a length of friction tape. Said a CAA inspector many flights later, "It's the most unorthodox, but the most permanent repair I ever saw."

* * *

NAVY INDOCTRINATION

Flights to military installations continue to be "tops" among Midwestern flying farmers. This desire to learn about their Armed Forces at first hand is expected to result in at least three flights to southern Naval Installations this winter.

On these flights, FF's are housed in Navy barracks and eat Navy chow. These visits do not cost Uncle Sam a dime, as each is charged for his "keep" on a day-by-day basis.

* * *

A "DRY" CONVENTION

John Barleycorn and his co-conspirators lost another round when cocktail parties were ruled out at the National Flying Farmers Convention held recently in Yosemite National Park.

Most flying farmer meetings are of the family-type affair. The presence of children is one good reason FF's give for saying "no" to the liquor interests who seem determined to infiltrate every segment of society.

Sometime ago Midwest FF's were invited to help dedicate an airport at a city noted for its breweries. When an invitation to visit the breweries was firmly rejected, the breweries countered by sending a dozen truck loads of beer to be passed out for free.

* * *

NEW PHILOSOPHY

One of the best things aired at the Aviation Writers Convention held recently at Miami Beach, Fla., was a talk by the irrepressible Bill Lear. Bill, it seems, had earlier stated that a minimum of 80,000 Light and Executive-type airplanes could be sold in the next ten years. In answering those who disagreed, Lear said the figure could well be many times the 80,000 mentioned.

Lear said "fear" was the one thing that stood in the way of great expansion in flying. Lear indicated that fear, which now keeps many people on the ground, could be overcome by turning most of the piloting over to instruments.

A survey made by this column a few years back showed that 72 per cent of the farmers contacted gave "fear" as their reason for not flying.

There is, in fact, plenty of evidence to prove that Lear knows exactly what he is talking about. His challenging philosophy is an exact about face from the old sob story we've heard for so long.

We have long needed the kind of a story Bill Lear tells. Its ingredients are, for the most part, "faith and hope," with perhaps a sprinkling of "charity" for some of us with lesser vision.

* * *

FF RESOLUTIONS

Two sections of the resolutions adopted at the recent National Flying Farmer Convention mildly urged CAA to "retain as large a portion of the LF range system as possible and to retain all standby generators in CAA communication stations."

Probably the most important resolution adopted by the delegate body was one pointing to the need of Agricultural-Aviation Coordinators in each CAA region.

A resolution also suggested that the Federal Airport Act be written to include a close-in landing strip program for rural communities. Left unmentioned by the resolutions were many matters of life or death importance to private flying of which flying farmers are a large segment.

COMMUNITY AIRPORT

Slater, Mo., population 3,070, has made a huge success of its 97-acre debt-free airport. Not a square rod of it but lends something to that success and to the community.

The runways use up 31 acres, and nice, well-defined runways they are. The airport administration building has modern kitchen facilities and is used by civic groups and youth organizations such as the Boy and Girl Scouts. It is available to any community civic group at no charge. Utilities are paid for from gasoline sales and farming operations.

No one remains on duty at the field, but since it is so close to the center of town, transportation is not a problem. A local service station operator goes to meet aircraft that indicate landing intentions.

"We built our airport in the boom era just after the late world war," relates Don Burr, chairman of the Slater Airport Board. "Our Board of seven citizens, appointed by the City Council for staggered terms, administers the project."

Work day projects for members of the Slater Chapter of the Future Farmers of America are a notable feature of the airport. Using machinery loaded by dealers, and seeds, fertilizers and spray chemicals donated by a State farm organization, the boys have established demonstration plots on airport property under the supervision of the Missouri College of Agriculture. At the end of the current crop year, checks of records kept on each plot will show the FFA members the farming practices which give the best results in their community. END

Breezin' down to Bogota

(Continued from page 31)

I was in the air, with a light north wind and the weather clear. Now I did something to be ashamed of. My plan was to go from the east to the west coast of Mexico, that is, from the Atlantic to the Pacific. In my mind's eye I saw a southwest course, and blithely flew away from Veracruz with a compass course of 200°. After 15 minutes flying, I woke to the fact that I wasn't seeing the check points I expected. It took me five minutes to realize that in order to cross Mexico at that point the compass course has to be about 140°.

Inland Mexico is tropical, lots of big trees, many rivers and no place to land. Halfway across, I ran into low clouds and, not wanting to get caught on top without radio, followed the railroad through the pass to the west coast, often with less than 500 feet ceiling and light showers. On the west coast, I broke out into clear skies and proceeded to follow the beach southeastward.

Today I wasn't making such good time. Ahead in all directions great cloud banks were growing. This is the wet season down here. Although this is still the Northern Hemisphere, they call the wet season, from April to October, Invierno, which means winter. I still wonder just where, south of the border they change our summer to their winter. The Pacific Ocean on the west coast of Mexico is very much the same as along California. The railroad hugs the base of the mountains and, to avoid flying into Guatemala, I followed it curve by curve.

When I landed in Tapachula, it was raining but was able to turn in my tourist card, clear customs, and gas up in less than an hour—paying, of course, 15 pesos to bring the Immigration Officer out in a cab. By this time, I had almost forgotten about Abe Strong. The weather to San Jose, Costa Rica was reported good and I filed a VFR flight plan, planning the 630 miles in seven hours, again pulling a Conrad boner. The flight along the coast is more east than south and when you get to San Jose, you lose one hour of sunlight.

Tapachula is close to the border of Guatemala, so for the next 150 miles, I flew three miles to sea to avoid international complications. As afternoon wore on, I could see wet weather in prospect. The beach becomes sandy, with practically no signs of life. In fact, I was surprised how few birds were around. From time to time a railroad or highway comes to the shore where straw thatched buildings must house humans, although I didn't see any of them.

Approaching El Salvador, I started running into tropical rains. These rains look tough and forbidding but are easy to fly through, even with cloud build-ups in all directions. The compass course along El Salvador is about 100° and for 60 or 70 miles is actually 90°. In the afternoon this time of year, the mountains are obscured by clouds. Numerous rivers flowing to the sea are dark brown, loaded with mud and they discolor the clear Pacific four or five miles out.

El Salvador and Nicaragua are separated by the Gulf of Fonseca. This water, dotted with numerous rock-like islands, reminded me of the approach to Prestwick, Scotland. The crossing here was about 25 miles and it felt good to get across to the steep-walled shore of Nicaragua. All I can remember of the next 50 miles is heavy tropical rain. I flew close to the beach, often only a few feet above the surf.

Approaching Corinto, Nicaragua, the weather suddenly cleared. Corinto is beautiful from the air—a wonderful harbor, in which were anchored six large boats. A little south of here I started noticing schools of fish. The ocean was placid but you could see large, dark, irregular areas of them. Big fish were feeding on the smaller ones, as evidenced by the turbulent action in the schools from time to time. At one place, I noticed a big white shark just lying on the surface in the midst of one of these

". . . his giant big toes reminded me of the heads of snapping turtles."

schools. I was 3,000 feet above looking straight down at it so I spiraled closer to the water. Every ten or fifteen seconds the shark would lazily move forward and the small fish would all try to jump out of the water to avoid it, but apparently the shark would get a mouthful. I spiraled to within 50 feet trying for a picture but the shark either had its fill or was frightened by the plane, and I didn't get the picture.

Seventy miles east of Corinto, the shore becomes rocky and a peculiar upcrop of what looked like a vein of coal sticks out of the water. That vein followed the shore for almost 40 miles.

Approaching Costa Rica, I ran into heavy rain. At one place I went 20 miles to sea to circle it and, by the time I got back on course, was over the pastoral part of that country. Flying over Costa Rica, one senses a land more like ours. It reminded me of eastern Texas in the wet season. I was still 100 miles from San Jose and the sun was beginning to set in the sea behind me, so I followed the Pan American highway, where my map indicated several airports. As I passed each of those strips, I noted it carefully, thinking that I might have come back to it. I was running into rain and, although my watch said six o'clock, it finally dawned on me that it was actually seven o'clock here. As I turned into the mountains to fly the last 30 miles to San Jose, I saw that rain and nightfall had beaten me. It would be smarter to go back to Las Juntas, some 25 miles. I landed at Las Juntas just as the darkness came quickly to the tropics. I sent a telegram to the immigration officer in San Jose telling him where I landed for the night.

The people of Las Juntas were helpful and friendly but I was tired so, with only a cup of very strong coffee and a piece of bread and butter, I went to bed before nine. When I say bed, I mean a piece of heavy canvas stretched tightly between four wooden poles. It was warm and sultry and I had no pillow but I went sound asleep immediately, though conscious all night long of rain falling musically above me.

I was up at five but the city was still asleep. By seven o'clock the weather looked flyable and I got a report from Pan American Airways that San Jose was ceiling 1,200, visibility three miles, light rain. That was enough. I followed the railroad up the gorge to San Jose. Twenty miles out, the sun shone through the clouds and I could hardly believe what a wonderful civilization I was flying over. On my map I wrote a little note—"this reminds me of Switzerland." The closer I got to San Jose, the better I liked it. On the map there was a warning sign that flying was prohibited over San Jose so I landed as soon as I reached it. By the time I had cleared immigration it was only 8:30 and I could have flown on to Panama easily but I took such a liking to the city that I decided to spend the day. "Abe will probably be around later in the afternoon anyway," I told myself. I met many local pilots and was entertained royally by Miguel Yamuni T., Cessna dealer there.

Several times during the day while talking to Costa Ricans about their country, they invariably would proudly proclaim, "Well after all, Costa Rica is the Switzerland of America!" I wouldn't mind living there.

Abe didn't show up, so early next morning I cleared for Panama and flew directly over the 12,600-foot mountains which razor-backed the center of Costa Rica and Panama. The country is unbelievably fertile. Giant trees and jungle growth cover this range even at its highest peaks, and from 14,000 feet I could see both the Pacific and the Atlantic. Possibility for developing this country seems boundless. What with the abundant water-fall, countless hydro-electric dams could be erected and Costa Rica made a paradise. Coffee and banana plantations dotted the landscape everywhere—coffee on the slopes of the mountains—bananas in the lowlands.

In Panama, the land becomes more ranch-like. There is good grazing and farming. It reminded me of Montana and, although there were countless banana ranches, I still think of it as a grazing country.

In these Central American countries,

all airports seem to be on the Pacific side, and besides that, there is flat grazing land and good beaches to land on. In approaching Panama, I flew far out over the Archipelago De Las Perlas, and being so high and making such good time, I decided to pass up Panama and go on to Turbo, Colombia. The 160-mile crossing of Panama was over high build-up of cloud. I had to climb up to 17,000 feet for a short time.

From the air, Turbo didn't look bad at all. I landed, cleared customs, and could have gone on to Bogota, but just decided to see this frontier town. The genuine, friendly way they treated me was second to none, although gas cost 58 cents a gallon. Speaking of gas, I shall never forget the gas attendant there. He was a colored man, at least seven feet tall, weighing not less than 300 pounds, not fat either, and his hands were twice as big as mine. He was barefoot. If he had shoes, I'm sure they would be size 18. I was fascinated by his feet. The skin on them was wrinkled and jet black. His giant big toes reminded me of the heads of snapping turtles I used to see on the Mississippi when I was a kid.

The airport is on a strand of land a half-mile off the mainland. Being gassed and tied down for the night I told Gustavo Ramirez, the radio operator at Turbo (who understood a little English) that I would like to see the city. He shook his head and said, "Turbo not good. You stay with us tonight. Supper at six." Then he arranged for me to get a ride over to the mainland in a modern speed-boat.

Gustavo was right, Turbo was not good. The first thing I noticed was the stench, and the second was two boys marching down the center of the muddy main street carrying a large sign advertising a movie. Neither of them wore a stitch of clothing but were calling something in Spanish to get attention. There didn't seem to be any real down town, just tin-roofed buildings where people kept out of the sultry sun. None of the children was wearing clothing; chickens, and pigs freely roamed about. Fifteen minutes of Turbo was enough. I took my boat back to the airport. A tropical storm was brewing so I made doubly sure HK 1119 would not blow away. It was dinner time now and I was invited up to the Ramirez apartment above the administration building.

There I got another surprise. Mrs. Ramirez was the prettiest girl I have ever seen in my life. Not over 22 years, she was a dream in a vivid green native skirt with sandals and earrings to match and a full white blouse interwoven with dainty green ribbon around the edge. She had long, naturally curly, jet black hair and, with all that, she could cook too.

Dinner was different, but good. We had trouble conversing, so immediately afterwards Gustavo showed me to my room. I had hardly got between the clean white sheets of my comfortable bed when the tropical storm struck. I couldn't help but think how helpless a person is on the ground when in its path. In an airplane you see it coming and just change your course a few degrees to avoid it. But the storm didn't disturb my slumber. The pounding on the roof and the wind whistling through the screens was exciting.

In the morning I arose about six o'clock, but there wasn't a sign of life around the airport. I went out to untie HK 1119 and waited for Gustavo to appear so I could pay for my gas and lodging and file a flight plan to Bogota. About seven o'clock he appeared, inviting me up for breakfast and by seven-thirty, I was all set to go. All he would accept was for the gasoline. The two meals and lodging were, as Gustavo put it, "You were our guest." Even today I wonder how two wonderful people like the Ramirez's could get marooned in a place like Turbo, 200 miles away from every place.

It was eight o'clock before I was in the air heading straight east over the jungle. This part of the country is almost trackless so I was aiming for the Magdalena River, which would guide me south as far as German Oland. I was under a solid overcast of about 10,000 feet with light rain and drizzle most of the time, and spooky looking clouds hovering over the jungle.

A hundred miles out I was passing the northern tip of the Andes and was able to start turning south gradually. Rather suddenly the weather cleared. I was able to climb to 10,000 feet, cleared ranges of mountains 8,000 feet or more. The slopes of these mountains were a surprise. The jungle had stopped and now I was over grazing country and good-looking farm land. In the distance I could see the Magdalena River and the rest was easy.

At German Oland, I picked up the railroad that winds and climbs from 600 feet to over 9,000 in less than 50 miles. The mountains that surround Bogota were covered with clouds that rested right on top of them. For a few minutes I wondered if I could get above them and, if I did, how I would get underneath again when I got to Bogota. Twenty miles out, flying at 16,000 feet, I cleared the clouds that clung to the mountains.

Five miles further it was like a dream below me, a flat plateau that made me think of Paradise. The ground looked as rich and fertile as Iowa, only it is at an altitude of 8,400 feet. Losing altitude and flying directly to Techo Airport was a thrill I'll never forget. The city itself is a miniature New York.

As I circled the field, I got a red light, just as Bill Sparks had told me, and the second time around another red light. On the third circle, another Piper just like HK 1119 joined the circuit and, although we were still getting a red light, I lined up for an approach on the active runway, blinking my navigation lights in series of three to indicate, "I want to get down!" I got the green light all right and the other *Cub* followed in too.

On taxiing up to the parking area where the customs stood waiting for us, who do you think was in the other ship? You're right! My friend, Abe Strong. END

HORTON

EXPERIMENTAL

As experimental aircraft go, William E. Horton's unusual craft is as strange an appearing vehicle as ever has been flown. Designated the HW-X-26-52, the experimental plane, as illustrated on the FRONT COVER of this issue, is in effect a flying wing. Huge wing fences "seal in velocity pressures," according to Horton. In addition, two retractable wings extend beyond the fences and mount conventional three-control system ailerons. They are extended in flight, may be retracted on the ground for storage.

The single rudder in the center of the fuselage is conventional. Vertical control is achieved by a split elevator below and to the rear.

The test model is powered by two 450-hp Pratt & Whitney *Wasps* mounting Hamilton Standard two-position propellers on 8-ft. shafts. A proposed executive version (as shown above) would have a pusher engine and rudders would be mounted on the trailing edges of the sealers.

The original flight test model was built from salvage of a UC-78 Twin-Cessna and surplus parts and equipment. First successful flights were made at Orange County Airport, Santa Ana, Calif., in January, 1954.

All God's Chillun

(Continued from page 28)

saved were still dying on the little islands. If only he had a plane large enough to accommodate stretcher patients and a medical attendant! Doubling as nurse to a hemorrhaging or vomiting patient while coaxing his *Silvaire* through the often rough Caribbean weather over shark-infested waters was unsatisfactory. Every time he landed after such a flight he would pray for some way to get his hands on a suitable air ambulance.

In the spring of '49, while preparing for a speaking tour in the States, Vincent learned of a used four-place Stinson that could be bought Stateside for $3,000. He got a good price for his Luscombe in San Juan. A New Jersey church contributed $1,700 of the Stinson price. Now, with a *Station Wagon* his dream of a stretcher-bearing air ambulance was close to reality.

The Mission's farm welding shop made up a stretcher small enough to be eased into the plane door and yet large enough to accommodate an adult. It was a sort of basket affair, much like Navy uses to transfer sick and injured from ship-to-ship at sea. The door had to be removed every time a stretcher patient was loaded. The co-pilot's wheel was removed and a hook and strap arrangement rigged near the dash to secure the head end of the stretcher. The right front seat was rebuilt and leaned aft so that it formed a continuing base for the bottom of the stretcher. With another mooring strap and buckle on the aft bulkhead of the cabin, the patient could ride without being jostled. A two point safety belt held the immobilized person securely on this "magic carpet." In the rear left seat behind the pilot, the doctor, nurse, or attendant could ride, leaving Vincent free to pilot the plane. Now more difficult assignments could be undertaken with the critically ill and in marginal weather.

Almost unlimited use of this unique mercy aircraft resulted. Because Vincent flew the poor and destitute as readily as the wealthy and privileged, the islanders needed no longer to die for lack of hospitalization. With this airplane more than $10,000 worth of charity flights were made from Vieques and Culebra to San Juan—figuring "cost" at $12 per trip.

From time to time additional alterations were made to improve the flying ambulance. Improvements included white enameling of the Stinson to reflect the tropical heat. Then in the summer of '52 Dr. Earl Brown, Director of Home Missions for the Methodist Church, led a movement to replace the worn Stinson with a plane especially built for ambulance service. Convinced of the vital role of Vincent's flying to his people, the Mission Board purchased a new Cessna 170-B, completely equipped with stretcher, radio and instrumentation to make it the last word in single-engine mercy aircraft. Additionally, Vincent now has another experienced pilot to share his missions.

So a man of action and good will with a tool as keen for mercy as for war lifted the burden of his people. John K. Vincent is not Moses but who will deny that he too has rolled back the sea. END

OVERNIGHT STOPS—No. 1

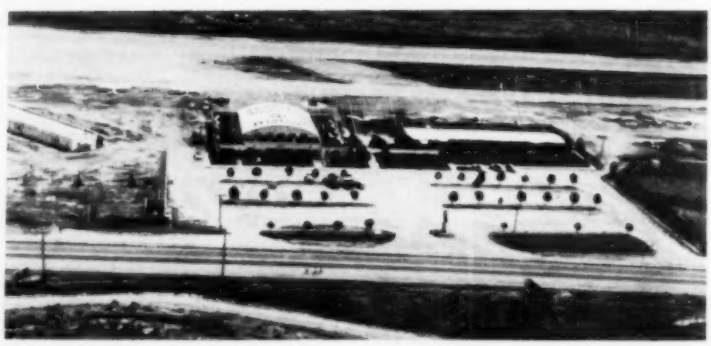
BRADLEY SKYTEL

The first in a series of overnight stops with on-airport accommodations recommended by pilots.

A good "skytel" for an overnight stop is as hard to find as the proverbial needle in a haystack. Here is one to remember next time you are out in Idaho.

Operated by Aircraft Service Company at Bradley Field in Boise, the Bradley Skytel is right on the flight line. Each unit has a private bathroom with shower, central heating and a private outside entrance. A free television lounge, courtesy cars and nearness of the airport cafe add to the attractiveness of this neat facility.

Moderate rates prevail. Singles are $3.50, double-bed room is $5.00 and twin-bed rooms are $6.00. Courtesy cars are not free, but are furnished on a kitty basis, with the customer paying according to his conscience.



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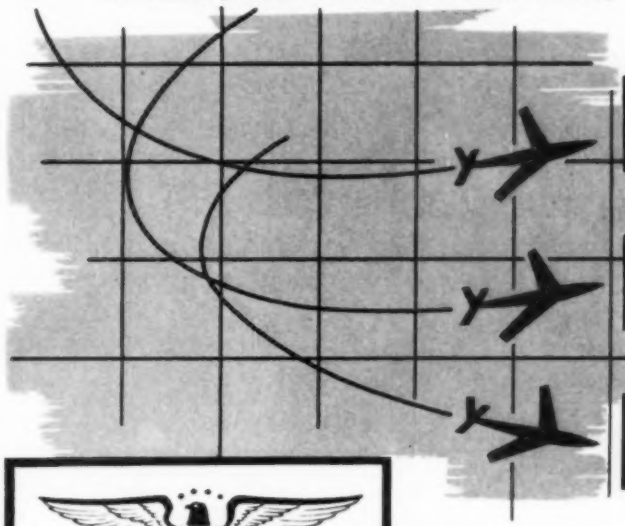

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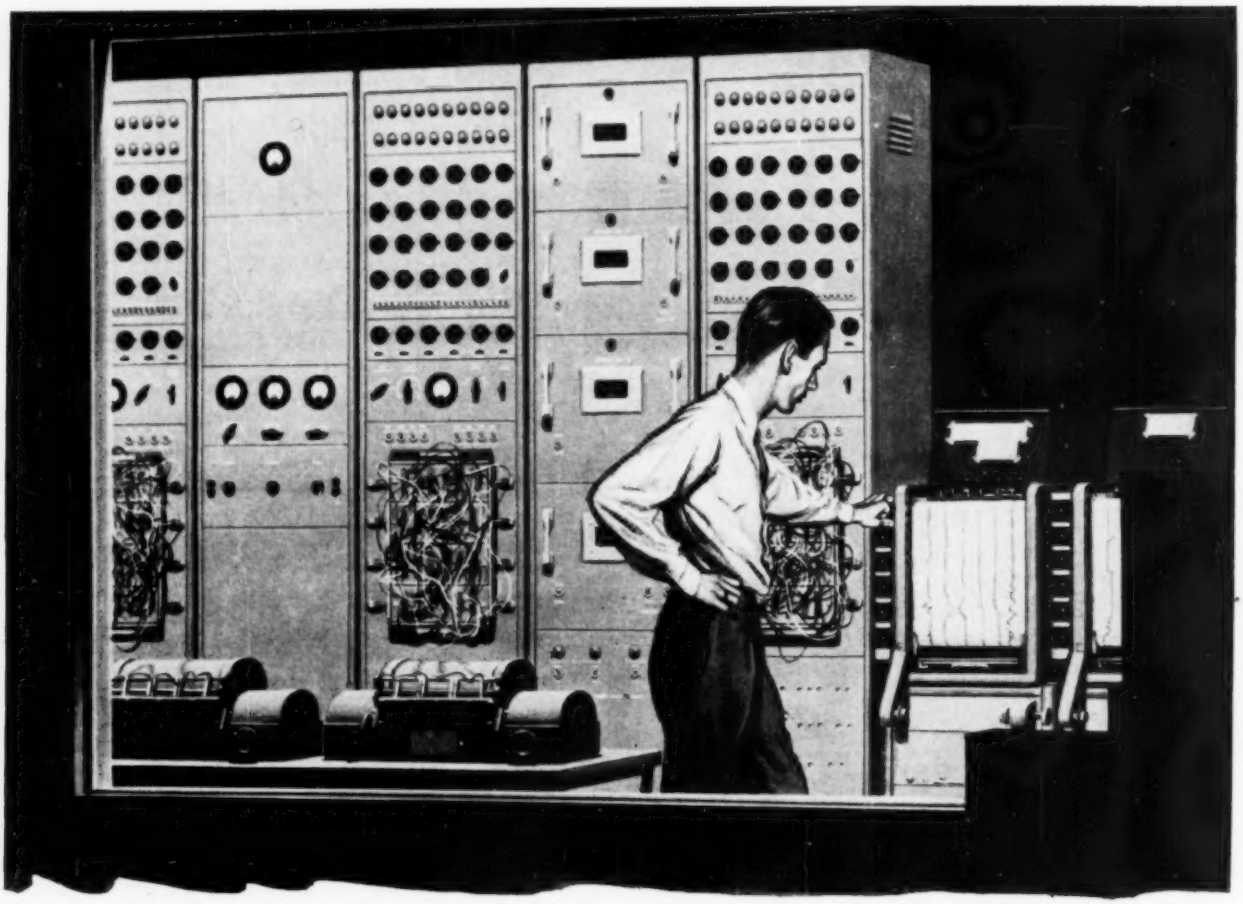


INVISIBLE JET FIGHTER MAKES TEST FLIGHT

This Grumman jet fighter is invisible. She is electrons. Yet day after day, she makes supersonic flights through an electronic sky.

Actually she is an electronic brain by name of REAC (Reeves Electronic Analog Computer) directed by a group of brilliant human brains. The latter convert the mathematics of the aircraft into a language they and she understand. They "tell" her everything they know about the new fighter design through wired panels and curves wired on revolving drums.

The cockpit with its human pilot is plugged in. At a signal he takes off and climbs to fifty thousand feet. The electronic air is smooth up to the transonic range where sound waves pile up until the air misbehaves. Once through, the air is smooth again, and they are ready to test a combat maneuver at supersonic speed.

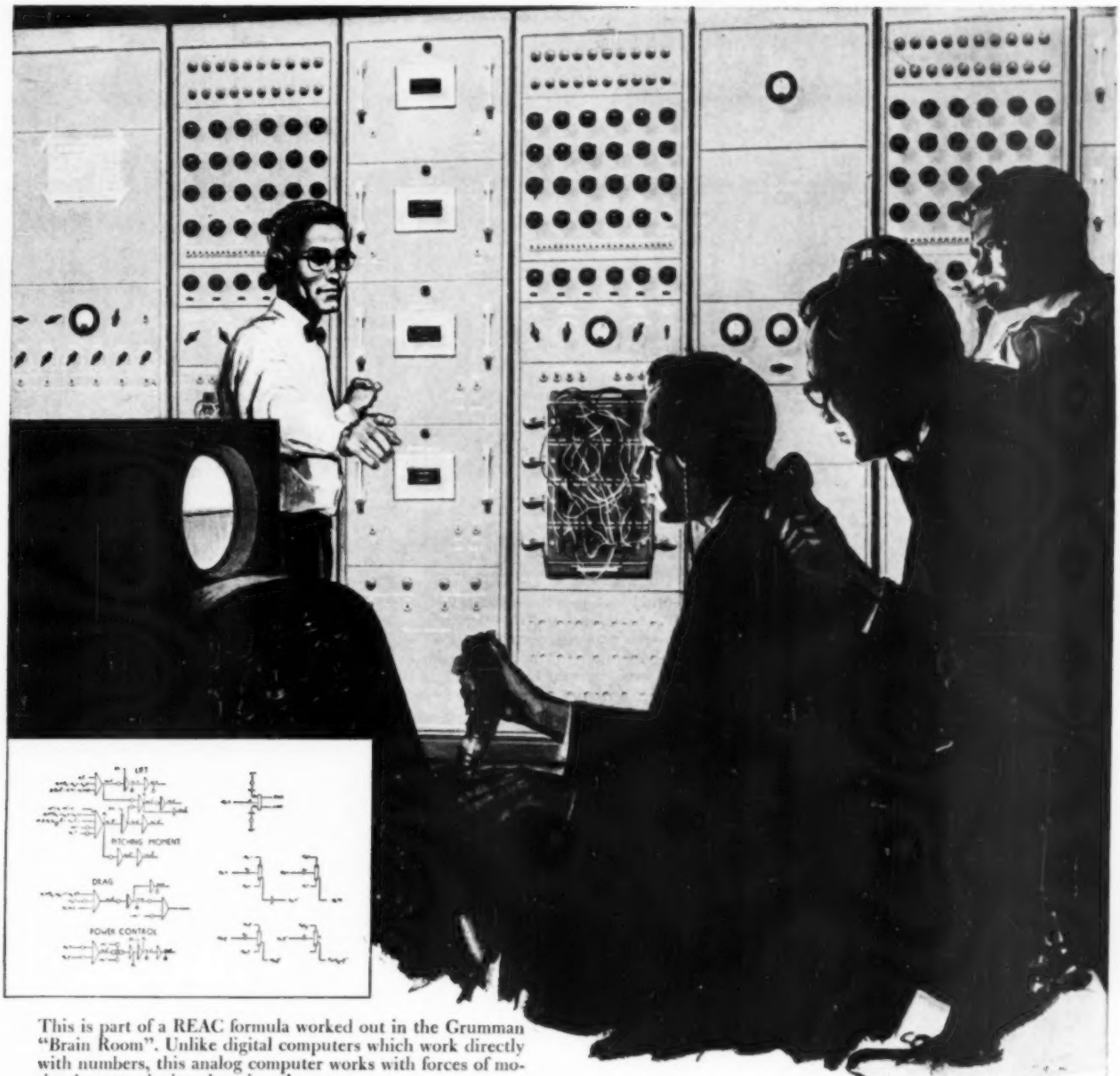
"Now decelerate."

The pilot extends speed brakes. All eyes watch the instruments, and the reactions recorded on moving graph paper.

These performance data, gained months before actual flight tests, help check designs created with results from other Grumman research. One reason Grumman planes are ready in quantity when needed.

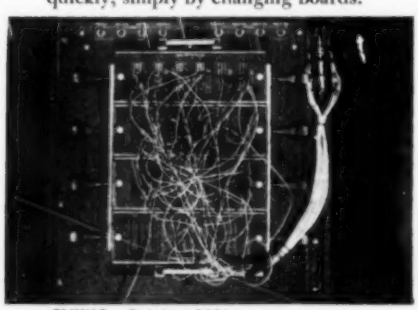
GRUMMAN AIRCRAFT ENGINEERING CORPORATION • BETHPAGE • LONG ISLAND • NEW YORK

Designers and builders of the Cougar jet fighter, the S2F-1 sub-killer the Albatross amphibian, metal boats, and Aerobilt truck bodies.

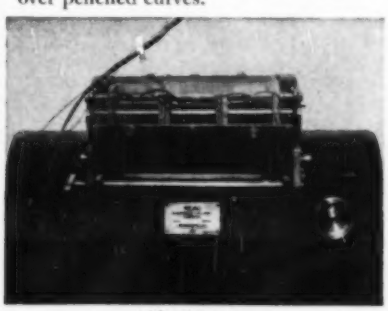


This is part of a REAC formula worked out in the Grumman "Brain Room". Unlike digital computers which work directly with numbers, this analog computer works with forces of motion by reproducing them in volts.

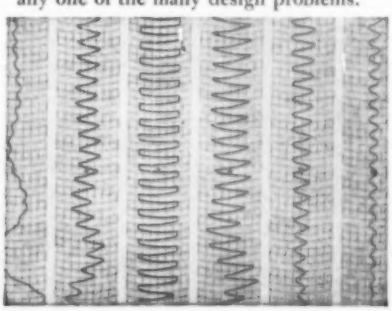
The computer is "told" the facts of the problem through miniature switchboards. A different problem can be made known to the computer quickly, simply by changing boards.



Some data, like wind tunnel results, are fed into the computer from revolving drums. The computer gets its information electrically from copper wires glued over penciled curves.



These are typical REAC answers. Engineers translate these squiggles into design information. Sometimes thousands of such answers may be required to solve any one of the many design problems.



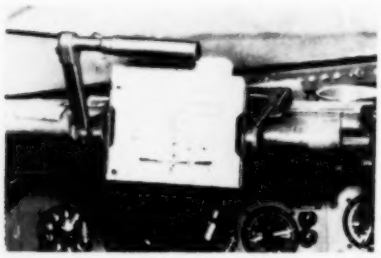
(Advertisement)

Briefings . . .

MANUFACTURING RIGHTS for the Aeronca Model 7 *Champion* have been sold by the Aeronca Manufacturing Corporation to Flyers Service, Inc., of Holman Field, St. Paul, Minn. Headed by Robert Brown, Flyers Service has specialized for many years in aircraft service, repair and maintenance. The contract included inventory, tooling, and engineering data for the *Champion*. The purchasers will set up a new corporation to be known as Champion Aircraft Corporation for production and sales of the ship. Production will begin immediately and the company anticipates being able to make deliveries within a few months.

TEST PILOTS CALL the Lockheed XF-104 the *Gee Whizzer*. A sleek sliver of aluminum, the high-speed, light-weight plane is classed as a superiority jet fighter, designed to establish local superiority in a given area by sweeping the skies of enemy planes. It is powered with a Curtiss-Wright J65 turbojet engine.

FLIGHT DESK, A PRECISION engineered navigation chart holder for holding and lighting of flight information material near the pilot's line of sight, is being distributed by Jeppesen & Co. Made of

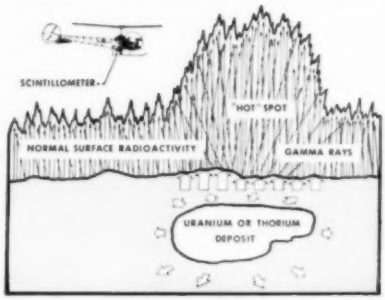


aluminum alloy, Flight Desk weighs 17 oz., folds flat for storage. Loads, provides for selection of red or white lighting, adjusts, or folds for storage with a one-hand motion. For use in all types of aircraft. List price $54.00 F.O.B. Denver.

AN AUTOPILOT for light aircraft called "PAR Pilot" is being produced by Summers Gyroscope Company of Santa Monica, Calif. A light-weight, two-axis unit, components are Sunmers PAR (Position and Rate) gyro, a flight controller and two position servo actuators. Total weight is 17 pounds. It has been certified by CAA.

WESTERN VILLAGE, a new and complete resort hotel in Tulsa, Okla., has a private airstrip 1700 feet long by 220 feet wide with clear approaches over the fairways of its golf course. Welcome mat is out for pilots. Facilities include swimming pool, golf, tennis, shuffleboard, driving range, badminton, cabana suites, patio dining, "Longhorn" dining room and coffee shop, Western apparel shops. Unicom to hotel reservation desk.

URANIUM PROSPECTORS have discarded the lowly burro in favor of helicopters to ride the radioactive air waves of Canada in search of the elusive ore. Equipped with a scintillometer to meas-



ure the number of gamma rays leaving the earth's surface, Bell helicopters operating north of Uranium City, Canada, creep across mile after mile of rugged terrain, hovering over "hot" spots, to make detailed surveys.

COURSES FOR THE TRAINING of Ground School Instructors, Aircraft Dispatchers, Air Traffic Controllers, and Commercial Pilots will be offered during the fall term at New York University, Department of Vocational Education. Airline personnel will give most of the instruction. All classes will be held in the evening after 6:00 p.m. Contact Professor Roland H. Spaulding, 34 Stuyvesant St., New York 3, N. Y.

ATLANTIC DIVISION headquarters of the Military Air Transport Service are being moved from Westover AFB, Mass., to McGuire AFB at Fort Dix, N. J. Eventually McGuire will be one of the key bases in MATS world-wide system and one of the largest Air Force bases on the East Coast. The Atlantic Division of MATS operates to the United Kingdom, Europe, Middle East and North Atlantic area as far north as Thule Air Base in Greenland.

A CESSNA 140A, flown by two El Paso pilots, Ruth Deerman and Ruby Hays, took first place in the All Women's Transcontinental Air Race sponsored by the Ninety-Nines. Second place want to a Cessna 170 flown by Frances S. Bera and Helen Albani of Inglewood, Calif. And third place was taken by a *Bonanza* A-35 flown by Gloria L. Smith of Phoenix, Ariz., and Dee Thurmond of Long Beach, Calif.

ONE MODERN BOMBER carries a million times the punch of all the B-17's that bombed Berlin in World War II.

MOONEY AIRCRAFT, INC., of Kerrville, Tex., has reopened production facilities at Louis Schreiner Field, following complete reorganization and refinancing of the company. Operations were suspended in February following the death of the company's president, Charles G. Yankey. Production is being resumed at once on the single-place Mooney *Wee Scotsman* and activity will be pressed toward certification of the four-place Model 20. New president of the company is Hal F. Rachal of Midland, Tex.; executive vice president is Norman F. Hoffman also of Midland; W. W. Evans of Dallas is general manager; and Al W. Mooney remains as chief engineer.

BRITAIN'S FIRST MILITARY jet transport, the Vickers 1,000, has been chosen to replace the Handley-Page *Hastings*. Similar to the Vickers *Valiant* jet bomber, the 1,000 is a swept-wing aircraft, powered by four Rolls-Royce *Conway* engines. It will carry 120 troops up to 2,500 miles. A commercial airline version now being developed is known as the V.C.7 and is regarded as a possible successor to the *Comet*.

ROUTE FOR THE INTERNATIONAL leg of the Texas Air Tour has been laid out to include four towns in Mexico this year. The famous annual tour of private flying Texans normally ends at Brownsville. At the invitation of the Mexican government it will now include Veracruz, Cordoba, Tuxpan, and Mexico City. The tour begins Oct. 9, will end in Mexico City about Oct. 21.

VEST AIRCRAFT COMPANY, Parts Division, has purchased from Temco the entire *Swift* project including all manufacturing rights, engineering, tooling, spare parts and CAA type certificate. VESTCO does not contemplate manufacturing the complete airplane but is tooling up for production of spare parts and sub-assemblies. The company is located at Sky Ranch Airport, Denver, Colo.

SKY RIDERS HOTEL, new 42-unit $350,000 development now under construction at Sky Harbor Airport, Phoenix, Ariz.,

will feature latest soundproofing techniques, refrigerated cooling, extra-large swimming pool. Target opening date is October 15.

AFTER SERVICE EVALUATION test of an oil additive called "Spotoil" conducted in a Pratt & Whitney R-2800-75 engine in a C-46, the CAA finds no objection to its use in this engine or in medium or low powered engines providing it is used in 1 part, or less, to 9

(Continued on page 54)

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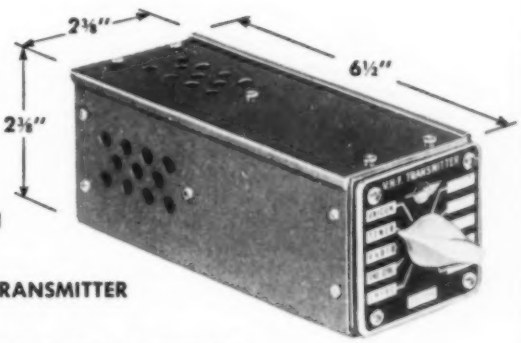

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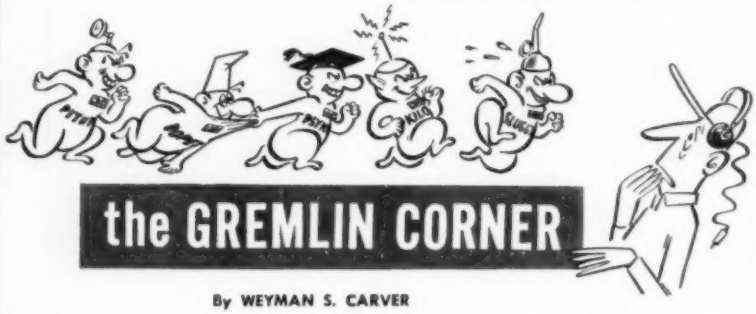

the GREMLIN CORNER

By WEYMAN S. CARVER

"HAD YOU NOTICED," Psyke asked, "how many opportunities there are for gremlins on the ground?"

We were sitting on the bench by the side of the hangar watching students practice landings. Dopey, Sludge, Pitot and Kilo were stretched out on the grass at our feet.

"Yes," Psyke answered his question, "there's lots of opportunities."

Dopey raised up on an elbow and looked interested.

"For example," Psyke said, "Do you see that puddle of oil on the ramp?"

Dopey raised up to see the oil.

"That oil has possibilities," Psyke finished.

I could not see any possibilities but Dopey got a gleam in his little green eyes and sauntered over to the oil puddle. He was quite casual and I did not think that much would come of this opportunity.

"Now," Psyke said, "notice that the pilot of that *Tri-Pacer* failed to put any chocks under the wheels."

"Yes," I said, "but it probably has the brakes on."

"Wrong," Psyke said. "He forgot to put the brakes on too."

"Still, there is very little wind blowing and it isn't likely to go anyplace," I said.

"That's what its pilot figured," Psyke replied.

Kilo, Pitot, and Sludge appeared uninterested in our conversation and wandered off. They were so casual that I thought they agreed with me about the possibility for gremlin work on the unchocked plane.

"Now," Psyke pursued his subject, "we only need one other item to create some action."

Little icicles of premonition pricked me wide awake. I looked at Psyke reclining against the back of the bench with his eyes half closed.

I whirled around and looked for the others. Dopey was idly tossing a rock up in the air and catching it when it came down. The other three were asleep in the sun under the tail of the *Tri-Pacer.*

"What," I asked, "is the other item you need to create some action?"

Psyke sat up, his little green eyes sparkling. He rubbed his hands together. "Made to order," he said.

"What's made to order?" I asked, as I followed his gaze. There was a little yellow ship coming down the taxi-way which ran about 30 feet in front of the *Tri-Pacer.*

"About ten feet in front of the *Pacer* the ramp slopes toward the taxi-way," Psyke pointed out.

"Yes, but—" I began, as the yellow ship got even with the *Pacer.*

Psyke jumped up, yelling, "Now!"

Pitot, Kilo, and Sludge popped onto their feet and leaped to the landing gear of the *Pacer.* As if a wind were blowing it, it rolled forward, hit the incline and sped down toward the yellow ship.

"Get it!" someone yelled.

Out of the corner of my eye I saw Dooley, the gas attendant, racing for the *Pacer* and I saw Dopey and the oil puddle in front of him.

"Look out," I yelled to Dooley.

Dopey stuck his foot out, Dooley hit it, and was already falling when both of his feet hit the oil. His feet shot up higher than his head and he hung in the air a long moment. He hit the ramp at the same time that the *Pacer* plowed into the prop of the yellow ship.

I paused a second figuring whether to go to the wreck or to Dooley. A couple of pilots rushed for Dooley, who was unconscious, and others ran for the wreck. I joined them.

Dopey was rolling on the ramp laughing so hard that tears were streaming down his face. "Some make it, some don't," he choked. "Dooley didn't make it because he left oil on the ramp."

"Perfect," Pitot exclaimed happily as he surveyed the wreckage.

"That gust of wind cost a few hundred bucks," one of the pilots cracked.

"Wind nothing. Those gremlins," I said, "did it."

"What?" one of the pilots asked.

"He can't see us," Kilo chided me.

"Nothing, nothing" I replied to the pilot.

"Don't we get some wonderful accidents!" Sludge exclaimed.

"The best," Pitot concurred, "and all because some pilots think their job is over when they get a ship on the ground." END

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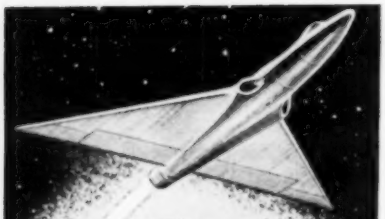

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Briefings . . .

(Continued from page 50)

parts of regular oil recommended by the engine manufacturer. Since no tests were run with detergent type oils, it is not to be so used until evaluation tests can be made.

AUXILIARY PYLON FUEL TANKS for the Northrop F-89D *Scorpion* give greatly increased operating range to the all-weather interceptor. Although the tanks are almost 15 feet long and weigh more than two tons when filled, they do not appreciably affect the plane's high speed. When fuel is expended, the tanks are

ejected by use of an explosive cartridge fired by the pilot. The tanks are the product of Pastushin Aviation Corporation.

RECORD FOR THE WORLD'S largest international civil airplane regatta is claimed by the Los Angeles Jr. Chamber of Commerce for its 13th "Holiday on Wings" flight to Ensenada, Mexico. More than 135 planes gathered for the mass flight over the border.

MR. PEEPERS OF TV FAME is learning to to fly at Spring Valley Airpark, N. Y. Bill Bohlke, veteran pilot and flight instructor, says that Wally Cox, who plays the timid Jefferson High School teacher in the popular TV program, is a natural pilot.

PACIFIC AIRMOTIVE has recently opened a new branch at Stapleton Airfield, Denver, Colo., to serve the Rocky Mountain area. PAC's other branches are located at Chino and Oakland, Calif.; Seattle, Wash.; Kansas City, Kans.; and Linden, N. Y. Headquarters are in Burbank, Calif.

QUALIFICATION FOR STUDENT, private, and commercial flight tests, aircraft, glider and helicopter, together with instructor and instrument ratings are covered in detail in the new manual called "Pilot Certificates." Listed as Civil Aeronautics Manual 20, it is available for 75 cents from the Superintendent of Documents, Washington 25, D. C. In addition to telling how to prepare for each maneuver, the manual sets forth the performance standard required.

IN WORLD WAR I, it took fighter planes an hour to climb to 6,000 feet. Today, Navy carrier-based fighters can reach altitudes greater than 10,000 feet in less than two minutes.

SETTING THE PACE for safety clinics, the the San Bernardino County (Calif.) Sheriff's Aero Squadron sponsored a highly successful aviation flight safety clinic this summer which was attended by more than 100 pilots. CAA's Ontario Aviation Safety District organized the affair and supervised instruction which ranged from sessions in Link training to 30-minute flight checks.

MORE THAN TEN TIMES as many persons were killed in the United States in 1952 on bicycles than on the scheduled airlines, according to CAB chairman, Chan Gurney.

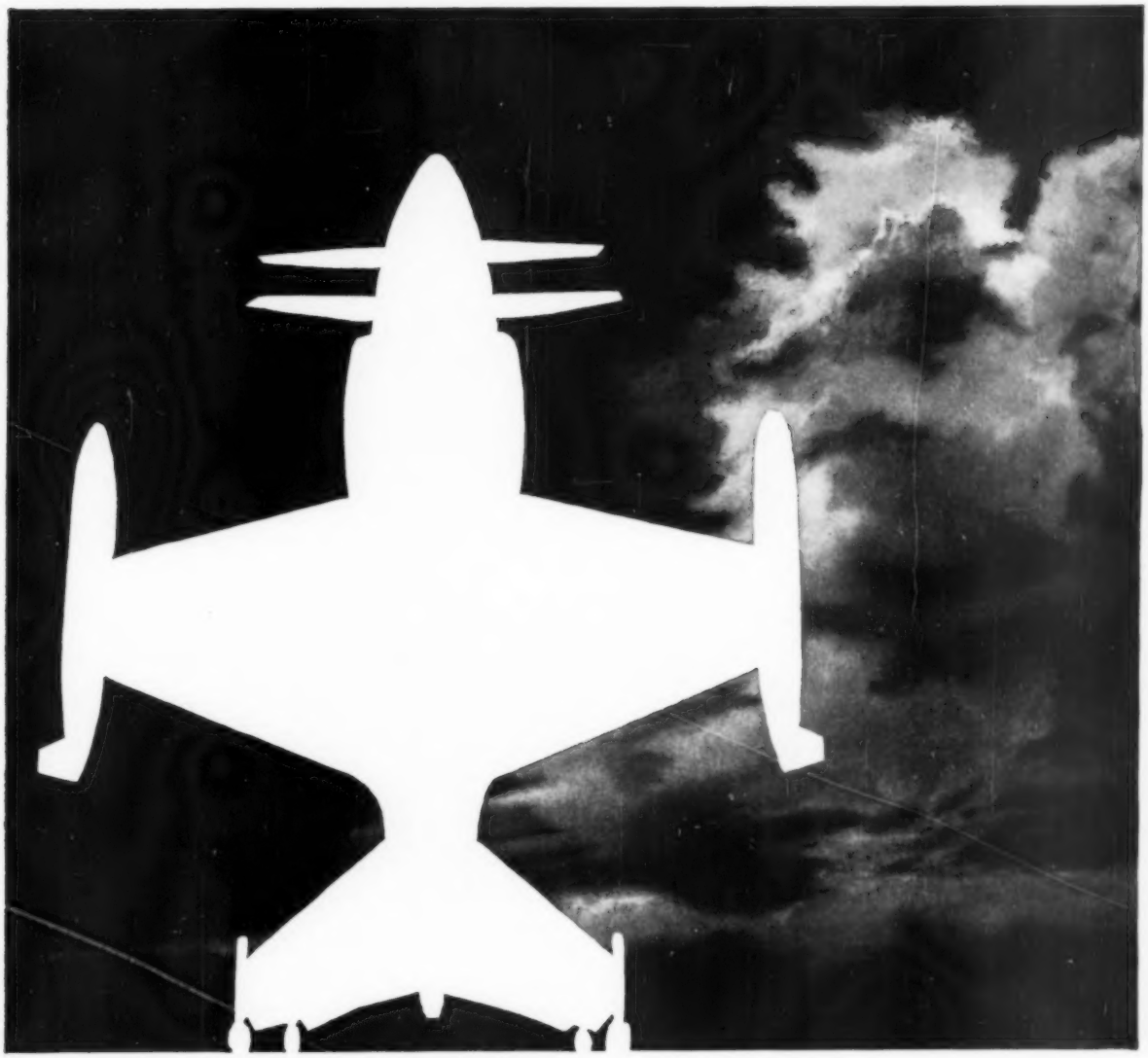
REBECCA, THE RADAR DEVICE developed in Britain during World War II for aircraft supplying agents in enemy territory, has now been adapted for jet fighters. It weighs only 40 pounds, works on the compass principle without use of a bulky screen, has a range of 200 miles and margin of error of 4 per cent. A glance at the instrument shows the pilot his exact distance from base and gives him a homeward bearing. A larger version for airliners will be installed by BOAC, Air France and other foreign lines.

REDUCTION IN PRICE has been announced for the three-place Hiller 12-B helicopter. By removing accessory items required for military use, the price was brought down from $36,000 to $33,400.

CONTACT WITH OTHER AIRPLANES for aerial refueling is made by Boeing KC-97 tankers on an average of every 15 minutes, twice around the clock, seven days a week.

CONTINUING to donate her time and services to the Civil Air Patrol despite physical handicap, Doris May of Endicott, N. Y., confined to her wheel-

chair with osteo-genesis, monitors the CAP radio daily, assisting in CAP and Civil Defense missions. According to Group officers, Mrs. May has "been worth her weight (45 pounds) in gold many times."



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AOPA NEWS

Aircraft Owners and Pilots Association is a service organization for the private pilot or aircraft owner. AOPA's full time staff is devoted to helping the individual pilot. Its aim is "To make flying more useful less expensive, safer and more fun."

Headquarters address is Box 5960, Washington 14, D.C. Members also receive a special AOPA edition of FLYING, newsletters and confidential aviation data. Opinions expressed in this column are not necessarily those of FLYING Magazine.

INSACS, L-F RANGES

Through the efforts of AOPA and other segments of private aviation, all of the 37 Interstate Airways Communications Stations (INSACS) and 52 low-frequency ranges, scheduled for closing under CAA's economy program, have been saved.

In final action on the CAA budget for fiscal year 1955, the Senate approved $1,200,000 more than the amount approved by the House of Representatives.

The Senate action stemmed from Senate Report No. 1541, "Department of State, Justice, and Commerce Appropriation Bill, 1955" submitted for the Committee on Appropriations by Senator Bridges. The report stated:

"The committee has carefully considered the adverse effect on aviation and public safety embraced in the plans to discontinue certain aids to air navigation.

"After exhaustive testimony on this subject both from Government officials and others interested in aviation safety, the committee is recommending an increase of $1,400,000 for operating 52 low-frequency radio ranges, which serve the military and civil aircraft that are equipped only with low-frequency radio receivers, and 37 radio stations that furnish air-ground communications used in air traffic control.

"This committee has always insisted that nothing be done in any way to jeopardize aviation safety."

When the bill finally passed, the sum appropriated for operating the radio navigation aids mentioned in the committee report was pared to $1,200,000. This amounts to CAA's having to do the job with $200,000 less than the committee recommended. "That's standard operating procedure for Congressional budgetary action," a CAA official told AOPA.

PILOT POLL TO HELP CAA

CAA Administrator Fred B. Lee (AOPA A1585) has assigned a special group of CAA officials the task of learning exactly how AOPA members and other civilian non-airline pilots use the Federal airways for VFR flying. Conferences between the group and AOPA staff officials have been under way for some time.

To help the CAA group in its research, AOPA inaugurated in July the first in a planned series of AOPA Pilot Polls.

The Pilot Poll seeks information on how much of the time AOPA'ers use the airways and associated radio navigation aids to conduct flights under all weather conditions.

The knowledge the group obtains from AOPA is to be the basis for a reevaluation of CAA's airways use concept under VFR conditions. If the CAA, as a result of the reevaluation, should abandon its present IFR-only concept and embrace the VFR policy advocated by AOPA, the whole understanding of civil aviation in the United States could undergo important changes.

The Pilot Poll plan was designed as a result of many past occasions when AOPA needed quickly a general cross-section of member opinion or other vital information.

It is planned that Pilot Polls will be used in the future to obtain current information from members on various subjects as the needs arise.

The Polls are being conducted by special questionnaires distributed with the monthly AOPA Confidential Newsletter. The questionnaires are arranged so that they can be answered with a minimum of inconvenience and so the answers can be quickly and easily tabulated by AOPA's IBM Department.

AOPA RING, TIES OFFERED

Continuing its long-established policy of making available to its members high quality, personalized AOPA jewelry and numerous pilot-flying accessories (like sun glasses, windshield decals, and lapel and automobile insignia) at low cost; AOPA recently announced the development of both an official AOPA ring and an AOPA necktie.

The AOPA ring was designed by Jostin's, manufacturers of the 1954 West Point and Annapolis class rings. It displays the AOPA shield, flanked by AOPA wings and underlined by the member's registration number handsomely engraved. Made of 10-karat yellow gold, it weighs 13 pennyweight and is guaranteed for life by the manufacturers.

The necktie is an adaptation of the "old school" tie idea developed for AOPA by the Harvale Company of New York City. It is a distinctive piece of wearing apparel which serves as a symbol of AOPA's aviation brotherhood. The ties highlight jacquard woven multiples of the AOPA lapel pin in attractive yellow-striped diagonals on blue or maroon silk backgrounds.

AIRCRAFT LIST COST REDUCED

AOPA recently announced a 10 per cent reduction in the price of its aircraft listing service from $25 to $22.50 per thousand items supplied.

The list of aircraft owners maintained by AOPA is the only complete and up-to-date one in the country. It includes all U. S.-registered aircraft, is tabulated by IBM equipment, and is kept current by monthly revisions.

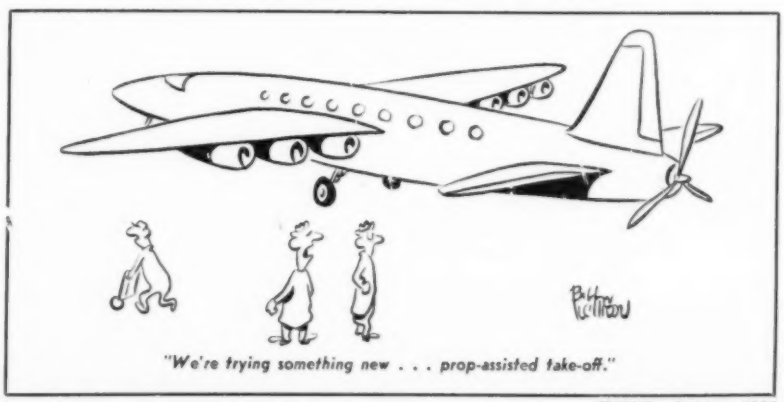
Two standard lists are available to the aviation industry on a not-for-resale basis. The lists select aircraft by make or by state. They include not only the owner's name and address, but complete information about the aircraft (make and model, engine make and model, serial number, class of certificate, type of ownership and year of manufacture).

Further breakdowns can be had at an additional charge based on IBM time needed for sorting. Quotations are made on the basis of requester's needs.

Also available is a subscription service of monthly additions, deletions and changes to the original list.

The new discount price for the lists and the subscription service was made possible by increased AOPA IBM facilities and a streamlining of tabulating methods. Any listing of owners can now be supplied within 48 hours after an order is received.

Further information may be obtained from AOPA National Headquarters, Box 5960, Washington 14, D.C.



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MARTIN 202

I learned about flying from that!

(Continued from page 41)

Radio came on with a special weather report from Portland. Still plenty of ceiling, but visibility down to six miles in light sleet. I noticed a little snow in the rain I was flying through, and made my 180 degree turn and started back down the Turnpike. The Wasp asked for more heat. The rain made quite a racket on the *Beaver*'s big wing. The ceiling stayed between 500 and 600 feet, but visibility was dropping fast.

I flew down the Turnpike just as I'd practiced it many times in beautiful, clear weather. Everything looked familiar. I came to the right spot, turned quickly to a heading of 150° and eased back on the throttle. My passenger almost jumped out of the plane!

"We're going to land at Beverly," I said casually, and as I finished speaking, the beautiful sight of the runway showed up through the spattered windshield. No traffic pattern this time. The weather was getting worse by the second. Close the throttle, drop the flaps, a straight-in approach.

We landed and taxied up to the hangar. I wasn't what you'd call scared, but when I pushed the rudder pedals to set the parking brake my knees were wobbly. It was nice to sit there on the solid ground for a second after I stopped the engine and hear the patter of sleet on the airplane.

While I was doing all this, Northeast Airlines took off in a *Convair* for Portland. They went on to Bangor. A few minutes after two, just about the time I'd have reached Portland, a *Navion* landed there "covered with ice." Two friends, each of whom has been flying more than 20 years, flew from Portland to Port o' Maine Airport, about three miles, and had to leave their plane there overnight.

I drove from Beverly to Portland.

I don't make apologies for the sudden change in the weather. It fooled better men than I. I do apologize to my guardian angel for not turning back to Boston, not landing at Revere, and not landing at Beverly the first time I passed. I was an accident looking for a place to happen when I persuaded myself that things would get better up ahead. I should have taken the hint when the ceiling fell out of the sky several hours before any precipitation had been forecast. I almost got myself into trouble; but I didn't.

I went through the situation with a minimum of sweat because the Boston & Maine pilot told Percy Billings to learn how the ground looks from a few hundred feet. Percy passed it on to me. I've practiced my bad weather, low-level approaches at all the fields I habitually use. And when I saw that spot on the Turnpike I *knew* a heading of 150° would line me up beautifully on the southeast runway at Beverly.

I learned about flying from that! END

It costs $210,000 to train a B-47 pilot, including his cross-training as bombardier, navigator, and radar operator. Valuable man!

San Francisco Airport and the **AOPA**

Early in 1950 San Francisco Airport issued new general rules and regulations, among them the following: "*Rated Cruising Speed;* No aircraft having a rated cruising speed of 120 mph and being capable of maintaining such speed within the traffic pattern of the airport may be operated within the control zone or land or take off unless its pilot has received permission for each such landing and takeoff from the airport manager." "*Airport May Refuse Clearance;* The airport manager may delay or restrict any flight or other operations at the airport and may refuse take-off clearance to any aircraft for any reason he believes he can justify."

This was strong medicine. No other airport in the nation had such regulations. But it was plain that, if these went unopposed, others might institute them to the very great disadvantage of private plane pilots.

The AOPA was in the vanguard of opposition. As Aviation Editor, Bob Sibley, of the Worcester, Mass. Evening Gazette, in discussing the development, put it, "The Aircraft Owners and Pilots Association is a national organization, two-fisted and peppery, which is unaccustomed to taking any nonsense from anybody." AOPA executives and legal experts went to work. They pointed out that in their opinion the regulations were discriminatory, did not comply with the Federal Airport Act and, if enforced, could ban the use of the airport to 90% of private fliers.

In voluminous correspondence, publicity, personal contact with CAA and other agencies the AOPA point of view was strongly presented. Result: the regulations were repealed.

This is just one of many instances in which the AOPA has battled successfully for the interests of the private pilot. Add your strength to the fight for the private pilot's welfare and enjoy many money saving benefits which only AOPA membership provides. Join AOPA now — today!

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BEWARE—THE SUPERSONIC BOOM!

A shock wave created by a supersonic airplane passing in close range could possibly destroy a light plane, stated Raymond H. Rice, Vice President and Chief Engineer, North American Aviation, Inc., at a recent meeting of the Institute of the Aeronautical Science in Los Angeles.

The shock wave, by its nature, has a pressure drop across its width. At Mach 1.2 (or 1.2 times the speed of sound) this pressure drop amounts to about 50 pounds per square foot or the equivalent force of a wind blowing 140 mph. If the plane slows to subsonic speed, the wave continues and, if directed at the earth, a loud "boom" results when it strikes the ground. The closer the airplane comes to the earth before slowing to subsonic speed, the louder the "boom."

At a recent demonstration of the North American F-100 at Palmdale, Calif. the force of supersonic "booms" was unintentionally demonstrated. The pilot flew the F-100 over a group of newsmen gathered for this first demonstration to the press. The first pass created a boom that raised considerable dust off the airfield. The second pass knocked out all of the windows and heavy plate glass doors in the front of the airport administration building. Officials tried unsuccessfully to notify the pilot of the damage he was inflicting. The only means of communication was by telephone to Edwards Air Force Base control tower and then by radio to the F-100. Before contact could be made, the pilot made his third pass. Since all of the glass had been knocked out of the front of the building, the shock wave entered unhampered, traveled down the corridors, and knocked out all of the windows in the back of the building.

When asked what would happen if a pilot directed his shock wave at another aircraft, Mr. Rice stated that an airplane stressed for supersonic speed could withstand the shock wave, but the pilot of the plane hit by the wave would receive a bump he would long remember. Aircraft not designed to withstand the 50 or more pounds per square foot pressure differential probably would be destroyed.

—BY EUGENE R. GRIESHABER

Flight Scholarships

(Continued from page 37)

most fertile and available source of piloting potential among American youth.

In Michigan the average light plane dual instruction costs $11.50 per hour. Allowing for 10 hours of dual, we set $115 as the cost of each flight scholarship.

How to raise sufficient funds to finance a worthwhile percentage of our boys and girls was our problem. We decided that, inasmuch as we in CAP are all volunteers, we would stay away from public monies and sell our idea directly to firms, clubs, and individuals.

By speeches to clubs and personal letters, together with another "donation" by the Aero Club of Michigan, we created 72 flight scholarships and awarded them in one ceremony in November, 1953. Similar efforts produced a further awarding of 74 more in June, 1954.

Through contacts already established we can count on a similar substantial income each year. We are now setting up a CAP Cadet Flight Scholarship promotion board which will take over the fund raising detail.

Our goal is 500 scholarships each year —$57,500 worth. We probably could go to one large industry or foundation and raise that much in one swoop. However, we believe it better for many to contribute moderately and without too much fanfare.

Some of the more basic data of our program is as follows:

A Scholarship consists of sufficient money to pay for ten hours of dual flight instruction. The normal amount at this writing is $115.

Scholarships donated to the Wing are awarded by a Flight Scholarship Board.

Scholarships earned by or donated to particular Civil Air Patrol Units are awarded by a Unit Flight Scholarship Board.

Civil Air Patrol Cadets must meet rigid requirements to be eligible for Scholarships:

Must meet "Commercial Pilot" physical standards.

Must have reached 16th birthday and be not older than 17½.

Must have written consent of both parents or guardian.

Must evidence intention to complete private pilot license.

Must have satisfactory grades in school.

Must be on schedule in Cadet Training Program.

Must be outstanding in Cadet Unit Activities.

Must have been a CAP Cadet for six months or more.

Both male and female cadets are eligible. The method of nominating eligible cadets in a Unit is by popular vote of the cadet membership.

Selection of his or her flight school is made by the cadet.

Cadets must complete the ten hours of scholarship dual instruction within six months of the date of award.

In cases where a cadet is found unsuited for flight instruction by a Flight School, the funds return to the treasury.

Awards are allocated approximately on the basis of male and female membership strength.

We have many heart-warming by-products. Cadet Jimmy Wright received a scholarship last November. In January, a man of about 45 approached us at the airport and introduced himself as Jim's dad. He said "Jim's up taking a lesson. When he comes down I'm going up for mine. You know, Jim and I didn't have much in common until he won that scholarship. That got me interested. Now we're buddies. As soon as we are licensed, we're going to buy a plane."

Counting all awards made by Michigan CAP to date, we have 300 youngsters in the air who would not have made it otherwise. Many of our flight school operators have lowered their rates and given additional solo time to their CAP students in recognition of our efforts. Maj. Gen. Lucas V. Beau, USAF, National Commander of Civil Air Patrol, after presenting Flight Scholarships to 74 Cadets in Battle Creek on June 6th, said: "CAP has brought young people together with aviation on common ground but we have always had to stop short of our ultimate goal—actual flight training. In this respect the Michigan Wing has performed outstanding service to Civil Air Patrol, the United States Air Force and the American people, by originating, developing and proving the practicality of a flight scholarship program." END

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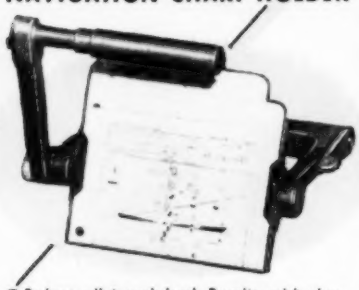

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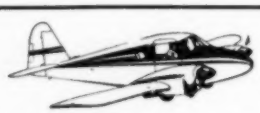

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Let's Fly a New Airplane

(Continued from page 20)

up at this time: in a jet fighter it *must* be picked up to avoid damage to the gear caused by high airspeed which is gained quickly.

Now your practice in the cockpit while on the ground will help you to clean up the cockpit, get your power reduced, the props set, the temperature checked, and the climb stabilized. Go up to a reasonably safe altitude and use the check-off list to get into cruising speed. Relax and settle down a bit.

Now comes an Easy Rule which will enable any pilot to check himself out in a strange plane. If he'll do this *first*, before anything else, he will have no trouble: EXECUTE THE APPROACH STALL AND NOTE THE INDICATED AIRSPEED.

For lightplanes, the full stall is recommended. Be sure to observe carburetor heat precautions in power-off stalls. Multi-engine aircraft should not be full-stalled but, in either case, observe the change in feel of the controls, the action of the plane, and any tendency to snap, spin, fall off, or become erratic. Modern planes do not, as a rule, have bad tendencies, but it is better to find out at safe altitude.

Always note the indicated airspeed at which the stalls occur, disregarding the altitude and temperature corrections. Next observe the altitude at the moment of the stall, then, recover, using takeoff power and lowering the nose to the horizon or slightly below it. Attempt to recover with minimum loss of altitude. Note the altimeter and observe the altitude lost. The amount of altitude lost represents the minimum height above the ground at which a pilot can recover from an inadvertent stall without disastrous results.

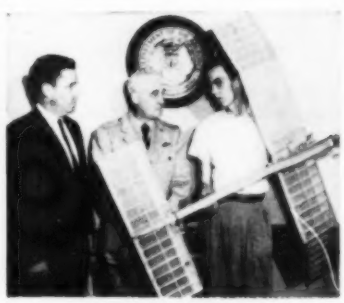
You now are familiar with this strange plane and, before going back to the field, will want to try some steep turns, climbs, and glides. The shallow chandelle, which is not necessarily an acrobatic maneuver, is excellent for getting the feel of the plane, and is a lot of fun. Glides should be attempted at 60 per cent, 40 per cent and 20 per cent above the stalling speed as you noted it, NOT the speed given by the Handbook. If there is a discrepancy between your speed and the one given in the Handbook, it is probably due to instrument error, loading, temperature, water in the pitot tube, or an unknown factor. And this is important: 20 per cent over the stall is the absolute minimum airspeed (known as the "Never Subceed Speed") under any cond.tion, 40 per cent is the speed over the fence and 60 per cent over the stall gives the safest, longest, and so-called "Normal Glide," more aptly and correctly termed, "Maneuvering Speed."

So let's go back and prepare to land. The plane is almost an old friend by now, but get out the Checkoff List. No aircraft ever gets so friendly that it will use the Ch.ckoff List for you. Such things as landing gear down, carburetor heat on, flaps set, fuel selector on fullest main, trim tabs, and prop pitch must not be a mental hazard during landing. Get them taken care of on the downwind leg. Now get settled into Maneuvering Speed, turn to the base leg, and establish the glide in your Final Approach.

The modern, preferred method to establish the glide is to use a power approach, especially in heavier aircraft but, even in a lightplane, this seems to be best. There is less possibility of carburetor ice, less altitude lost in an inadvertent stall. The control of the plane is improved, and the accuracy of the landing is better.

As the field boundary is approached, plan to decrease glide speed to the "over-the-fence" speed of 40 per cent over the stall. Do this either by decreasing power or by adding flap, or both; the airlines prefer to add flap and leave the power constant. Although landing technique is not within the scope of this article, it is well to observe these measures to prevent possibility of over-shooting. In a new plane a go-around may complicate things.

Transition from one plane to another, whether it is from reciprocal engines to jets, from low to high power, or from single to multi-engine, is essentially a problem of knowing the airplane (the Handbook), knowing the cockpit (the gauges), and familiarization (actual flight: power settings, airspeeds, and stalls). The manipulation of the controls is definitely not a major item, and the pilot who has a background of smooth, precise flying can fly one airplane as easily as another if the three items just mentioned are carefully observed. END



AIR OLYMPICS

Model airplane champions from 11 nations competed in the first annual World Model Air Olympics at New York's Suffolk County Air Force Base. The United States Air Force was official host to the group and Convair division of General Dynamics Corporation sponsored the world championship contests.

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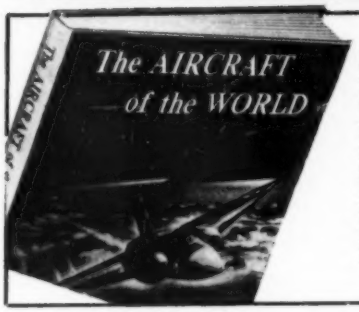

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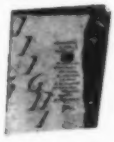

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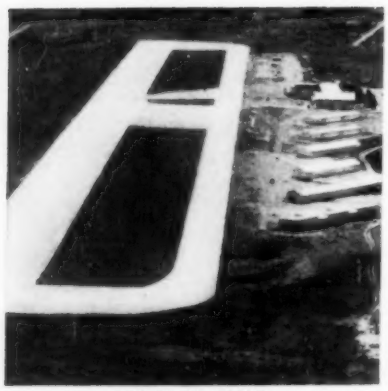

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Voice of the Tiger

(Continued from page 15)

the Orient. For example, they don't like Chiang because he will never again tolerate Occidental exploitation and he will do business with America and Japan in preference to nations rooted in colonialism. Our European allies have little interest in Japan's economic welfare. We have both a military and an economic interest; Japan's lack of its traditional Oriental trade is costing the U.S.A. billions annually but, more importantly, is fostering a Japanese depression which lays the ground for Communist organization among Japanese unemployed.

Q. Your solution centers on Chiang Kai-Shek?

A. Yes, for several reasons. First, it is Chiang's right to lead the fight for a free China and Asia. He has fought back and forth over China for 30 years; for nearly 20 of them he has been fighting the Communists. He knows their ways.

Second, he can go into action quickly enough to block usurpation of his authority in the UN by Red China.

Third, he offers the most immediate, effective, and economical means of fighting Communism and buys us time to establish a solid Asiatic policy.

Q. How much do you think it would cost us to support Chiang's return to the mainland of China?

A. It would certainly cost a great deal less than the two alternatives: (1) Being thrown out of the Pacific and rendering our homes in America vulnerable to future attack; (2) sending our own forces frantically at the last minute when Mao is already intrenched and starts to put the squeeze on us.

In 1948 I estimated for our Government that it would cost about 250 millions annually to put Chiang back into the field. That was before the upsurge of Soviet production had made possible the heavy flow of modern armaments to Mao. The combat effectiveness of Mao's present first line troops and planes has drastically changed that figure. The initial cost of arming Chiang today might run over 1½ billion. It might even run as much as we have given the French in Vietnam. Gen. Stillwell estimated that ten Chinese divisions could be properly maintained in the field at the cost of one U.S. division. Other authorities have given figures as high as 35-to-1.

Two factors must be borne in mind. One fixed cost is that of munitions. Maintenance and operation in the field is a variable cost. Chiang's soldiers get a pay of .50 U.S. coin per month. I would raise that to a dollar for morale, and it would still be a drop in the bucket. The real cost difference comes in requirements necessary for the Occidental soldier but not necessary for the native. Armed intervention by us in China would necessitate a 12,000-mile, fully-protected supply line to begin with . . . a staggering prospect.

As long as we hold strategic air command, some of the enormous costs of maintaining field armies is reduced by compensating factors requiring less troops. But once command of the seas or air is lost, we are pitched headlong into infantry warfare with every factor of cost and numbers relatively heavier for us.

Q. Do you believe Chiang could actually defeat Mao?

A. I have always believed so and I still do after living, fighting and working for 17 years in China through three separate wars, under two flags, as both a soldier and a civilian.

My answer is not like so many "*answers*" to Asiatic questions—a matter of "*viewpoint.*" The *hard fact* is that Chiang has twice shredded the Communist armies and licked them to tatters. But twice fate intervened. In one case, fate took the form of the Japanese invasion. In the other case, our tragic diplomacy pulled the rug from under Chiang at the critical moment. Yet except for his grit and tenacity, there would be left today no hope of a Free China.

Q. If Chiang had the planes and supplies needed how do you think he would move?

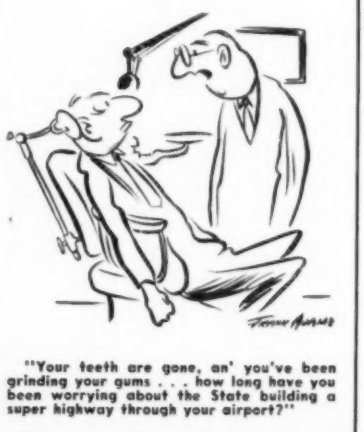
A. I believe that by agreement with Syngman Rhee, South Korean forces up to two million men would launch an attack northward over the 38th parallel and intrench along the Yalu River Officially, Rhee's interest in the war would terminate with unification of his country behind a strong guard upon its northern border.

However, there would be the threat that such a march might not stop at his own borders. Because of Mao's commitments to his puppet Communists in North Korea, he would have to pull first line troops and fighter pilots from South China and rush them north to Mukden.

As a diversion, a segment of Rhee's forces might actually spread out upon the mainland and lay seige to Mukden. They would do so, of course, as volunteer units under direct control of Chiang.

The drain upon Mao's South China forces would ease the way for Chiang's landing in Fukien Province, directly across from Formosa. With proper air coverage and an assured supply of American landing craft for transporting his troops, there is no doubt that Chiang

(Continued on page 68)



"Your teeth are gone, an' you've been grinding your gums . . . how long have you been worrying about the State building a super highway through your airport?"

Apache Evaluation

(Continued from page 27)

place the customer in the left seat, even though he may have no prior multi-engine time. Due to the direction of the wind, it was necessary for me to take off toward and over the town of Lock Haven. For this reason and because of reduced visibility and low clouds, no effort was made to chop an engine on subsequent climb-outs. However, airwork convinced me that a safe climb-out could be made on one engine.

Power was reduced to 25 in. manifold pressure and 2,400 rpm for climb. The rate-of-climb figures given me by the company proved to be correct. A cruising climb speed of 120 mph is recommended because it gives a high forward speed as well as a good rate-of-climb.

The normal recommended cruising speed for the custom model is 160 mph at 9,000 feet at 65 per cent power. This power setting is obtained under standard conditions at 2,400 rpm and 20.5 in. manifold pressure. Fuel consumption at this speed is approximately 16 gallons per hour, or eight gallons per hour per engine. This consumption gives a total cruising range of 4.45 hours or approximately 710 miles. Once this airplane is levelled off at cruise altitude, it really "gets along." Frankly, I am still amazed at its all around performance. The noise level in the cabin was much lower than I had thought possible. Any rpm within the propeller pitch range can be used up to 2,700. The engines are approved for continuous operation at 2,700 rpm. However, a conservative power setting of 2,100 rpm is recommended to reduce excessive wear and tear on the engines and propellers, to hold down cabin noise level, and to reduce fuel consumption.

Use of the mixture controls for cruise conditions will cut down fuel consumption by approximately 10 per cent. All of the above fuel consumption data is with the mixture controls in the lean position.

It is a simple operation to feather one of the props on the *Apache*. When I retarded the throttle on the right engine, there was a very noticeable yaw to the right. This was easily controlled with the rudder and, of course, the airplane can be trimmed for satisfactory single-engine flight. After the throttle had been retarded, the propeller pitch control on the dead engine was pulled fully back beyond the stop into the feathering range. This process completely feathered the propeller. After this has been accomplished, you move the mixture control to the idle cut-off position and turn off the ignition switches. For best single engine performance, the dead engine wing should be held up about three degrees higher than level to help counteract the tendency to turn in that direction. Turns were made in both directions and proved to be entirely satisfactory.

Like feathering, unfeathering of the propeller is simple. You turn on the ignition switches of the dead engine, mixture in the full rich position, throttle cracked about ⅛ in. open, prop control at cruising setting or same as the other propeller control, and depress starter button until propeller starts windmilling. I emphasize that the pilot should give a little thought before depressing the starter button, just to make sure that he pushes the proper one. Throttle should be moved full back to idle, to allow prop to unfeather smoothly. If engine is very cold, engine controls should be adjusted for a slow warm-up before returning to cruise power setting.

The generator and hydraulic pump are located on the left engine. Should this engine fail in flight, all unnecessary electrical equipment should be turned off to conserve the battery. It would also be necessary to extend the landing gear with the emergency system. Future plans involve installation of dual generators, now optional. Should the right engine fail, the vacuum pump will no longer function, and the Directional Gyro and Artificial Horizon will not operate. It will then be necessary to use the primary group for instrument flight.

Propellers can be feathered only when the failed engine is rotating, because the centrifugal force due to rotation is necessary to hold out a stop-pin which keeps the propeller from feathering each time the engine is stopped on the ground. Should an engine freeze, a very rare occurrence, it would be impossible to feather its prop. Single engine flight can be maintained with the dead engine

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unfeathered, but there is a noticeable decrease in performance in this case.

The *Apache* probably can be landed with the gear in retracted position without extensive damage to the airframe. All three wheels extend about one-third of their diameter when retracted and structure is provided to take minor loads in this condition. Flaps should not be extended during a "wheels-up" landing. This will save damage to flaps and wings. Incidentally, only 30 to 40 strokes of the emergency pump handle are required to lower the gear and 12 strokes to extend the flaps.

The company pilot had me make a take-off at full throttle and 2,100 rpm and the performance was much better than I had anticipated. Since acceleration is so rapid on the *Apache* and the take-off distance so very short, it may be desirable not to use full rpm on take-offs with the exception of short runways.

The novice multi-engine pilot will experience no difficulty in making approaches and landings. Gear should be lowered at a maximum speed of 125 mph, preferably on the downwind leg to give time for planning approach. Flaps can be lowered at speeds of 100 mph or less and the ship should then be trimmed to a gliding speed of 90 mph. By holding about 12 in. manifold pressure, a good approach angle is maintained.

Throttles should be retarded just prior to contact with the ground. By keeping the propeller controls at 2,400 rpm, sufficient power is available in the event a go-around is necessary. This setting will also prevent over-speed if the throttles are advanced sharply. Single engine landings are just as easy. However, in this case it is wiser to come in a little higher and slightly faster (make sure you don't overshoot the field). As power is reduced on the good engine, the rudder trim should be taken out to help hold the ship straight.

Landing gear and flaps should not be lowered until you are positive of reaching the field. Remember, if your left engine is inoperative, it will be necessary to pump the gear and flaps down with the emergency hydro pump but, as I mentioned before, this process requires little time.

At maximum gross weight the single engine ceiling of the *Apache* is approximately 6,250 feet on the critical or right engine. This ceiling will increase as flying weight is decreased. Good single engine performance depends on several factors: gross weight, density, altitude, power output on the good engine, (it is better to have more than a sufficient amount of power and then to reduce it accordingly, rather than use a little and try to increase it), and piloting technique.

Stalls with power on and off and with gear and flaps retracted and extended were performed. All stalls were gently and easily controlled. Controls were effective at speeds down through stalling. Aileron control was excellent. There was no roll-off or sudden pitch-down tendency Stalling speed with full flaps proved to be 60 mph and about 64 to 65 with gear and flaps up.

The *Apache* is certainly an asset to purchasers in increased utility and safe extension of flight during darkness and over water. This writer would recommend limited instrument flight, however, due to the fact that the plane has no deicing equipment.

If you get a chance to fly the *Apache*—don't pass it up. You must fly this remarkable twin to enjoy its sparkling performance. END

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Gunnery Meet

(Continued from page 22)

Wing from Turner AFB, Albany, Ga., was SAC's entry and finished second with a score of 2,755 points. The Far Eastern Air Force's 8th Fighter Bomber Wing came in third with 2,386 points.

High individual honors went to Korean veteran, Charles C. Carr of Nellis, who finished an even 100 points ahead of his nearest competitor as he shot 852 of a possible 1,400 points in the combined events. SAC picked up second and third place prizes in the individual category with Capt. Donald W. Maggert scoring 752 and 1st Lt. Robert D. Williams scoring 740.

Maj. William H. Wescott of Nellis, the nation's 12th Korean ace, took the individual air-to-air trophy for his week's work. Although hampered by winds and clouds at both the four and five mile levels, he pelted the target to the tune of 354 of a possible 600 points. Nellis' Capt. Carr was a close second with 343 and SAC's Capt. Maggert had a 224 for third.

SAC's Lt. Williams led air-to-ground scoring with 551 of a possible 800 points as his team won this event. (Col. Cy Wilson, SAC team captain, was no stranger to the USAF Gunnery meet. In 1950 he led the team that won the propeller driven competition.) TAC's Capt. Claire O. Chennault, son of the famed Flying Tiger leader, scored second in the air-to-ground firing with 553 points, followed by Nellis' Capt. Robert T. Latshaw (14th Korean Ace), with 511.

Col. George L. Jones, Nellis' new training group commander and 30th Korean Ace with six and a half MIGs to his credit, led the ATRC team, and bested all other team captains with 678 points.

Teams from USAFE, FEAF, ATRC, and SAC also competed in the highly classified Special Delivery event, won by USAFE's England-based 20th Fighter-Bomber Wing. Maj. John Kropenick, USAFE, won individual team honors. Col. John A. Dunning, Wing Commander, captained the team. FEAF's entry scored second in this event. All participating craft were F-84G *Thunderjets* which dropped deadly looking dummy atom bombs. Delivery, judging and even the scores of this phase were classified.

The ground crews entered into the competition just as fiercely as their pilots and, when award time rolled around, were counted in for their share of kudos. If a gun jammed on a firing pass, the pass was counted nonethe-less, and a goose egg marked up for the pilot, so the crew members worked long into the night all week preparing their jets for the next day's competition. Their work paid off for the winners.

As one observer said, "Air-to-air combat is not like picking bottles off a fence, nor is hitting a tiny ground target from 500 mph dive a blind man's bluff either. The ragged aerial targets retrieved each day from the Nellis range, and the chewed-up ground panels at Indian Springs, attested to a high degree of deadly accuracy on the part of the Air Force's fighter pilots.

After watching a jet fighter snap a target bomb to the bulls-eye from 500 feet, a mechanic observed, "I wish I could spit that good." END

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According to the CAA, pilots who violate Danger Areas don't realize what may be sharing the air with them. Bombs, for example, may come whistling by. And not just plain bombs but high explosive, proximity fused, or photoflash. Guided missiles, smoke rockets and pilotless drones are just a few more reasons why such areas are an invitation to disaster.

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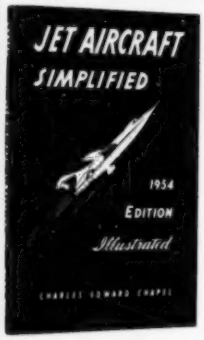
Aviation lapel pin collecting is Frank Strnad's hobby. In his collection are pins from airframe and engine manufacturers, airlines, airports, and aviation organizations.

A Hangar Inspector at Republic Aviation Corp., Frank has added his own, one five- and ten-year Republic service pins to his mounting collection.

Collecting 206 aircraft lapel pins is no overnight job. It has taken Frank Strnad 10 long and loving years.

—Terry Kay



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(Continued from page 64)

could gain and hold a beachhead.

Chiang's guerrillas would converge on Mao's flanks from south and southwest, while his regulars cut the supply line to Canton and Hongkong, and fought northward along the single railroad toward Hankow, and back to the coast for control of Hangchow and Shanghai. Simultaneously, Chiang's Navy, enlarged with American lend-lease craft, would blockade those ports from the sea. Food shortages would quickly do Chiang's work for him. He would control a 400-mile stretch of southern China, with a sea communication to his friend Rhee.

Q. What about Mao's numerical superiority?

A. Mao boasts 5 million men. Of those, 1 to 1½ million are loyal veterans, — well trained and well equipped by Russia. The remainder are largely impressed, badly trained and used chiefly for police work among unarmed peasantry.

Chiang Kai-shek can throw one million highly trained, and well conditioned men into the field. Practically all are veterans of regular actions, or experienced in guerrilla raids against the mainland. Chiang has never stopped fighting, even though lacking offensive arms and political freedom. In the Communist-held province of Fukien, directly opposite Formosa, Red Chinese intelligence lists over 10,000 guerrilla actions within one year!

Additional to Chiang's regulars, he can count upon 1½ million armed guerrillas pressing in to form a pincer movement as soon as he beaches on the mainland.

The unseen factor is that Chiang is worshipped by the peasantry while Mao is hated. Once Chiang unfurls his banner on the mainland, Mao will be blighted by spontaneous peasant uprisings and sabotage behind his lines, while Chiang will be enormously aided by gifts of food, volunteer work, and intelligence information.

Q. Is Mao not the better equipped?

A. Decidedly. Soviet Russia has given him modern weapons and can keep a field force of one million men supplied. Mao has plenty of trucks, tractors, heavy tanks, medium tanks, anti-tank guns, anti-aircraft, modern mobile artillery, etc.

This is all offensive equipment of a type we have not given Chiang. If we do back Chiang, and seriously mean for him to be successful, then we must supply him exactly as we would our own troops . . . with the best, and enough of everything he needs, at the time he needs it.

Q. Does Chiang compare with Mao in the air?

A. Not by any means. Mao has an air corps of over 2,000 Soviet-trained pilots and about 1,200 Soviet-made fighter planes, mostly MIGS. Against that, Chiang has perhaps 1,500 well trained pilots with 500 veterans in reserve, and about 500 screened students almost ready for their wings. His pilots have had no opportunity to fly the fastest fighters and until properly trained would be confined to a support role.

The brunt of the air assault would have

KIWI CLUB

With over 2,000 former American Airlines stewardesses as the basis of its membership, the Kiwi Club is a national service organization boasting one of the most attractive memberships in the country.

Growing out of informal gatherings over the years, the Kiwis met this summer in Chicago at their first national convention.

The four air transportation veterans shown here met for the first time in 12 years at the convention banquet. Left to right they are Mrs. Edward Cannon of Chicago, Mrs. Werner Rankin of Dayton, O., Mrs. Luke Mosley of Glen Head, N. Y., and C. R. Smith, president of American Airlines. The women served before World War II as AA stewardesses, then went into the Army Nurse Corps and were attached to the Air Transport Command's Air Evacuation activities in India. Mr. Smith was deputy commander of the ATC and the four last saw each other in 1942 when he passed through their base in India.

to be borne by foreign pilots with the latest planes, and to that end, I suggest an International Volunteer Group, similar in organization to the old Flying Tigers, or AVG. I have estimated that a combined air and ground personnel of 470 men equipped with 75 F-86's per group would meet immediate requirements.

Q. Is there a reason for your preference for volunteer fighters?

A. The great advantage of a volunteer group over regulars is their superior morale and development of close team work due to the group's restricted size. Such a group is free to train, operate, establish its own tactics and strategy, and to move with a flexibility and expediency without the restrictions of red tape, rank, rules and regulations that are unavoidable in a regular military establishment. From the cost standpoint, a volunteer organization will make as many missions as a regular air group with a personnel numbering less than one-fourth.

What the Flying Tigers accomplished was not mere chance nor so unusual that it could not be duplicated. The record we established was the result of being free, with capable personnel, to adapt our tactics to the enemy's weaknesses. The original Flying Tigers numbered a total ground and air personnel of 250 men and 100 Curtiss *Hawks*, inferior in several respects to the Jap planes we were fighting. We had few spare parts and no replacements. Yet in a six month period, this group accounted for 297 Jap planes confirmed. Unofficially the number was about double. Our own combat losses stood at 13 men killed, three captured, and 24 *Hawks* lost.

I believe an IVG could do the same thing today against the Communists. I would rate two groups capable of halting Mao's present air force and continuing to meet replacements by Soviet Russia. With four groups, I would undertake to wipe Mao's air forces out of the China skies.

Q. What would Chiang require from us to pursue the course you suggest?

A. First, definite assurance that we would not again pull the rug from under him to meet European pressures, as we did in 1947.

Second, that we would supply armaments in quantity and quality needed for combat effectiveness. I would suggest a watchdog committee in Congress for this purpose.

Third, is a military mission of sufficient rank and intelligence to act as advisors and to accompany Chiang's forces into action. A total of 6,500 officers would be sufficient, but the personnel should be picked. We can teach Chiang's soldiers much, but we cannot teach them to think like Americans.

Fourth, immediately start organization and training of the International Volunteer Group suggested.

Fifth, assure Chiang lend-lease of some of our moth ball fleet for landing operations.

Sixth, immediately start a flow of supplies to Chiang and provide him with 1,000 fighter-bombers for his own air force as separate item from planes for the IVG.

Q. Suppose Chiang fails to win?

A. That is a risk of war. At very worst, if we stick with him, he will launch operations before Red China gets into the U.N. and, by drawing Mao north, will pull pressure off Indo-China and other threatened southeast countries. Meantime, we will have a breathing space to establish some solid, sensible, realistic Asian policy.

I do not believe Chiang will lose. His landing on the mainland will be the rise of dawn for all freedom-loving China. Above everything, he represents *Asia for the Asians*, and the power of that cry will be thrown to our advantage.

The Communists have very nearly gained control of Asia. If we permit them to do so, we are going to be knocked out of the Pacific very quickly, and face something very desperate in the end. The question we face now should not be cluttered up with extraneous complications. The question is clear cut . . . are we willing to supply our help now, when it can do some good? Or will we bog down until the clock of another Pearl Harbor strikes? END

Mold for leaders

(Continued from page 19)

corps at his institution.

Between junior and senior years, AFROTC cadets attend one of several summer camps at Air Force Bases throughout the country. This camp, four weeks in duration, enables them to meet operational Air Force personnel and participate in the functions of the Air Force.

Once a student is enrolled in the basic course, he may be eligible for deferment from induction under present Selective Service laws so long as he remains in good academic standing in college and the AFROTC program. He must sign an agreement that, if commissioned in the AFROTC program, he will serve a minimum of two years active duty and six years in the Air Force Reserve. Entrance to the advanced course is highly selective and based on many factors. Among these are a relatively high academic standing, outstanding leadership characteristics, and an interest in flight training if physically qualified.

The basic cadet is issued an Air Force uniform, but receives no monetary allowance. Once selected for the advanced program, a cadet additionally receives around $27 per month.

This, in brief then, is the background of the organization which must supply the bulk of the nation's future air leadership. This headquarters will read with interest the series of articles to follow in FLYING from the pens of the cadets, officers and educators who are engaged throughout the nation in molding that leadership. END

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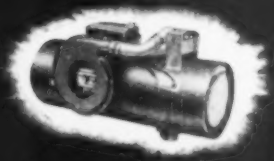

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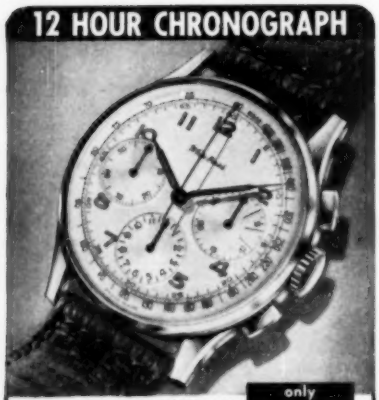

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There's a lot of comfort in flying the F-86 *Sabrejet* these days because of the multiple array of safety devices in the sleek fighter. Despite criticism which has belabored heavy safety equipment in the past few months, every pilot is secretly glad they are part of his aircraft.

There usually are a few "bugs," however, in even the most carefully engineered fighter. One of these which regularly brings caustic comment from jet pilots is the tendency of the nose gear to "cock." Without warning and for no apparent reason, the wheel may swing out of alignment with the result that on touchdown it may be swiveled around as much as 90 degrees out of position. This, naturally, means that the wheel cannot revolve.

Just such a mishap befell a pilot of the 63rd Fighter Interceptor Squadron of Oscoda Air Force Base, Mich. Flying an F-86, the pilot was in the traffic pattern when he noted a warning light on the instrument panel flashing red. Checking with a wingman, the unhappy pilot learned that his nose wheel was cocked 80 degrees to the right. Ruddering the aircraft violently from side to side, snapping the stick back and forth, proved of no avail in straightening the gear.

At that point the pilot voiced his predicament to the tower. Several emergency procedures were reviewed and discarded. A belly landing meant possible loss of the fighter —not a pleasant prospect in these days of shortages. Bailing out meant a sure loss. Even dragging it in, the pilot could not hold the nose wheel off on landing by pulling full back on the stick, at less than 95 mph. There was no surety, either, that the nose gear would retract in the event "bellying in" was ordered.

The Oscoda operations officer was a resourceful man, however, and after discarding all known solutions, he swiftly pioneered what is now an almost standard cocked-wheel procedure. His life-saving, plane-saving idea was one of the most novel stunts in aviation history to get the fast jet down safely.

On quick consultation with the engineering officer of the squadron, it was found that sufficient "aerofoam," standard charge for fire extinguishers, was available to lay a slippery strip down the center of the runway. Hastily, jeeps, line cars, etc., were pressed into service, discharging a strip of aerofoam about three inches thick and three or four feet in width down the full length of the 2,500-foot runway. Foaming onto the concrete surface, the "chemical blanket" thus effected provided a greasily smooth, easily followed strip, on which the nose wheel could slide while the main gear straddled it in normal landing procedure.

Thoroughly briefed on the "grease path" laid for him, the F-86 pilot lined up carefully, dragged the aircraft in, full-flaps, and touched down gently. While nervous operations personnel watched, the cocked nose-wheel skidded smoothly through the foam for a distance of several hundred feet without vibration and no tendency to rip out of the aircraft. When the F-86's rolling speed had dropped below 60 knots per hour, the nose-wheel suddenly snapped into place and the aircraft was stopped with no damage whatsoever.

—LT. ROBERT A. LATIMER

A Backward Glance

(Continued from page 29)

out, I turned around to get something out of my suitcase and stopped frozen! In all my haste and hurry, I'd left my two suitcases next to the flight office back in Macon. It just doesn't pay to hurry!

Do I know everything there is to know about flying? Far from it. I've only scratched the surface—the more I find out about it, the more I find there is to know. One of my good friends and the pilot I respect most is an old timer who stopped counting hours in 1944 after logging 10,000. I wonder now if I ever will accumulate 10,000 hours. Will I then know everything about flying? Somehow I doubt it, for I notice that my 10,000 hour-plus friend is still asking questions, too.

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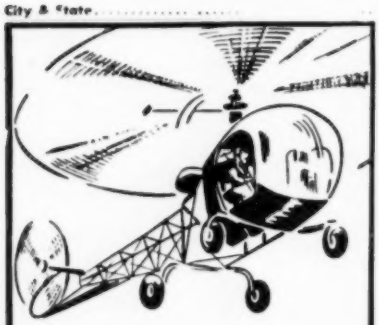

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FLYING CALENDAR

Sept. 7-12—S.B.A.C. Flying Display and Exhibition, Farnborough Aerodrome, Hampshire, England.

Sept. 10-12—Flying Farmer Conference, Idaho Falls, Idaho, 4-states district.

Sept. 11-12—AOPA's seventh annual Round-up Flight, Nantucket Island, Mass. Rain date, the following weekend.

Sept. 12—Idaho Air Breakfast, Idaho Falls, Idaho.

Sept. 16-18—National Plowing Contest near Olney, Ill. Landing facilities nearby. Contact: Flying Farmers, P.O. Box 6368, 42d St. Sta., Indianapolis 5, Ind.

Sept. 18-19—The Ninety-Nines Northwestern Sectional Meeting, Seattle, Wash.

Sept. 19-21—International N. W. Aviation Council, Vancouver, B. C.

Sept. 26—Quad City Airport Dedication, Moline-Rock Island, Ill. Details will follow later.

Oct. 7—Farm Progress Show, near Camden, Ind. Landing facilities nearby. Contact: Flying Farmers, P. O. Box 6368, 42nd St. Sta., Indianapolis 5, Ind.

Oct. 9-16—Sixth Annual All Texas Air Tour with 5 day extension to include flight to Mexico.

Oct. 16—Missouri Pilots Assn. Fly-in to Missouri-Indiana football game at Columbia, Mo.

Oct. 17—Idaho Air Breakfast, Challis Venison Steak Fry with Sourdough Hotcakes and Choke-cherry syrup.

Oct. 27-29—National Business Aircraft Assn. meeting at Hotel Adolphus, Dallas, Tex.

Nov. 11-15—Wake Island Pilots Association Mid-Pacific Jamboree. Single engine aircraft. Free food and lodging. For further information, write Lou Bove, Secretary, WIPA.

Nov. 12-14—Texas State Aviation Convention, Galveston, Tex.

Information for this column must be received at FLYING's editorial offices, 366 Madison Avenue, New York 17, N. Y., three months prior to the event.

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